708

Golden Gate National Recreation Area
Dog Management Plan
Final Internal Scoping Report

Golden Gate National Recreation Area

November 7, 2005

National Park Service, US Department of the Interior

Table of Contents

Introduction

Although dogs not restricted by cage or leash are generally prohibited across the entire National Park Service (NPS) (36 Code of Federal Regulations Section 2.15 (a)(2)), local practices at Golden Gate National Recreation Area (GGNRA or "the park") since its inception in 1972 , an increase in the number of dog walkers using the park, and changing expectations for use of the park have resulted in confusion, controversy, and even litigation over dog management and off-leash dog walking. Unmanaged dog walking has compromised visitor use and employee safety, affected the park visitor experience, and resulted in resource degradation which, given the history to date, will escalate if not addressed in a comprehensive dog management plan. These impacts are believed to be potentially serious enough that, without action, the park resources and values described by the GGNRA enabling legislation could be compromised to the extent that they would not be available for the enjoyment of future generations.

In response to these issues, GGNRA has decided to prepare a dog management plan that could lead to new regulations for dog walking in GGNRA. However, the park must first complete the environmental planning process prescribed by the National Environmental Policy Act (NEPA), which in this case means an environmental impact statement (EIS) must be completed. The EIS will examine the adverse and beneficial impacts of a full range of options for a dog management plan. Each alternative will meet the stated objectives of the planning effort, which are explained in detail in the *Purpose and Need* section of this document. In short, the objectives of the plan are to, in a clear and enforceable manner:

1. Provide protection of park resources
2. Provide for a variety of visitor experiences
3. Reduce visitor use conflicts
4. Ensure that park resources and values are available for future generations
5. Increase safety for staff and visitors
6. Comply with federal regulations

Largely because of intense public interest in, and debate about dog walking, GGNRA has decided to use a negotiated rulemaking process to reach consensus on proposed regulations for dog walking within the park. GGNRA will create a Negotiated Rulemaking Committee, consistent with the Negotiated Rulemaking Act (Rulemaking Act) and the Federal Advisory Committee Act (FACA), made up of representatives of all interest groups that could be effected by a change in the dog walking regulation. The Negotiated Rulemaking Committee (the Committee) will address how and where it may be appropriate to allow dogs to be off leash ("off leash" is assumed to mean "under voice control" throughout this document) in certain park sites. If the Committee reaches a consensus on an off-leash dog walking framework consistent with the obligations described in the section *Laws, Regulations and Policies* in this report, that consensus would be incorporated into one or more alternatives in this EIS, and could ultimately become the basis of a special regulation for dog walking in GGNRA in the Code of Federal Regulations. Although GGRNA intends to use a negotiated rulemaking process to promulgate a dog walking regulation, the park (NPS) does have the authority to promulgate a rule through the formal rulemaking process. The formal rulemaking process would not use a committee of interested parties; under formal rulemaking the park (NPS) would write a rule on its own, then seek public comment on the rule through the Federal Register. Whether a negotiated rule is adopted, or the NPS chooses to write and adopt its own rule, an EIS is required prior to the implementation of the dog management plan.

The negotiated rulemaking process has been previously used in two other national park units to address off-road vehicle management—Cape Cod National Seashore and Fire Island National Seashore. The GGNRA has committed to an effort to allow the NEPA and negotiated rulemaking processes to work concurrently, sharing information and fully analyzing all reasonable alternatives before making a choice on which to implement. The GGNRA Negotiated Rulemaking Committee is expected to make every effort to agree on when, where, and under what conditions off-leash, voice-controlled dog walking might be appropriate in the park, and it is envisioned that this agreement would be the basis of at least one dog-management plan alternative in the EIS. Because NEPA requires agencies to look at a full range of options, some alternatives may not include the Committee's recommendations and may propose off-leash, voice-controlled dog walking in other locations or under other circumstances, or assert existing or long-standing closures where pets are prohibited. It is expected that the alternatives would include where on-leash dog walking is allowed and under what conditions, along with where dog walking is prohibited to protect resources or human safety, or to provide a dog-free recreational experience in the park. The dog management plan alternatives must also include costs, environmental impacts, consistency with overall NPS management policies, logistic feasibility, enforceability, and other factors that the Committee may or may not concern itself with, depending on Committee members' interest and GGNRA direction.

Summary of Dog Management at GGNRA

The Golden Gate National Recreation Area was established in 1972 and now encompasses almost 75,000 acres in three counties in the San Francisco Bay Area. Of this 75,000 acres, GGNRA has title to 31,000 acres and manages 16,000 acres. The legislation establishing the GGNRA also established a Citizens' Advisory Commission, which would sunset no sooner than 1982 (NPS 2002). In 1979, due to public requests, the Commission developed and recommended a pet policy that established guidance in the form of suitable locations for on-leash areas and voice-controlled areas in lands owned and managed by GGNRA, and noted that "Implementation of the laws should conform with regulations to be developed by the NPS Field Solicitor's office." The "voice control policy," as this recommendation became known, did not and could not override the existing Code of Federal Regulation (CFR) section prohibiting pets off leash. Nevertheless, the park implemented the voice-control policy, and for more than 20 years it was in place in parts of GGNRA.

In the late 1990s and early 2000s, the Bay Area population and use of GGNRA park sites increased. Both owner and professional off-leash dog walking increased, as did uses of the park not related to dogs. Predictably, the number of conflicts between users began to rise, as did the fear of dogs, dog bites or attacks, and the frequency of dog and dog-owner rescues. In January 2001, the Commission acknowledged publicly that the voice-control policy was contrary to the CFR section prohibiting off-leash dogs, and was therefore null and void.

Hundreds of people in favor of the voice-control policy attended the January 2001 Commission meeting, and following the meeting, the park received significant comment in support of off-leash dog walking. At the same time, the park received an increasing number of complaints by park visitors, including minorities, seniors, and families with small children, alleging that off-leash dogs had prevented them from visiting the park for fear of being knocked over, attacked by dogs, or verbally abused by dog owners. Park staff attempted to help the transition into compliance with the CFR through educational outreach, signs, and law enforcement actions including verbal and written warnings and issuance of citations.

In January 2002, the park published an Advance Notice of Proposed Rulemaking (ANPR) in the *Federal Register* asking for comment on a proposed rulemaking process for dog management. It also held informational meetings about the rulemaking process in March 2002 and conducted a public workshop to receive oral comments in April 2002.

As a result of input from the public and other information (see *History of Dog Management*), the GGNRA chose to explore negotiated rulemaking, using a mediated committee of members of the public as described above. Unless, and until, a new rule is developed (after the NEPA and Negotiated Rulemaking Processes are complete) allowing off-leash use in the park, dogs are allowed only on-leash in specified areas of the park. These processes are estimated to take two to three years from the time they are formally initiated with a "notice of intent" in the *Federal Register*). In addition, many park areas are closed to dog and human use for resource or safety reasons. The closures are reviewed and updated each year through the use of the Superintendent's Compendium. It is considered the responsibility of visitors to determine, by consulting the compendium each year, if the area they wish to visit or walk their dog in is closed. They may do so by consulting the park's Web site or calling the park office.

Current Dog Management Problems

As required by the National Environmental Policy Act of 1969 and the NPS Director's Order 12, "Conservation Planning, Impact Analyses and Decision Making," an internal scoping session of park staff and consultants was held in January 2005. Internal scoping consists of defining the purpose of and need for taking action, discussion of planning objectives, and conceptual approaches to alternatives. Observations of current issues surrounding the dog walking controversy generally fell into the following categories:

- Expectations and desired visitor experience of dog walkers.
- Impacts of off-leash dogs on cultural and natural resources in the park.
- Ranger and visitor safety.
- Visitor experience.
- The particular needs of an urban area.
- Public confusion over NPS policies and mission.
- Public lack of understanding and confusion over GGNRA's mission and NPS regulations; and why some park areas are completely closed to dogs while other areas allow on-leash use.
- Ability of park staff to enforce rules.

Expectations and views of dog walkers

The increasing intensity of views of some members of the public was initially surprising to park staff. In response to the ANPR in January 2002, the park received 8,580 comments (Social Research Laboratory, Northern Arizona University 2002a), and of these, the great majority (71%) favored allowing off-leash dog walking at selected GGNRA sites. In addition to exercise benefits and comments that dogs and dog owners are generally friendly and enjoyable, the remarks showed what might be a cultural shift in the attitudes of dog owners toward their pets over the last decade or two. Dog walkers have been described as "behaving much like parents at playgrounds—clustering in groups, admiring, rebuking, exchanging stories and advice" (Gustaitis 1998). Of the people who replied to the ANPR notice, 984 mentioned the sociability benefits that off-leash dog walking provided, not only for the dog owners, but for the dogs themselves. Others

responders cited the "therapeutic value" dog owners experienced in knowing that their pets had been well exercised. More than 500 affirmed what they believe to be their right to walk dogs off leash at park sites. Other reasons given in support of off-leash dog walking concerned the benefits to humans, including increased sociability with other dog walkers or with visitors who enjoyed interacting with dogs, and the safer feeling some dog owners have when they visit urban parks, especially at night, if their dogs are present.

Resource Impacts

Dogs, particularly those off leash and without adequate voice control, have been reported, both in related literature and in park records, to chase wildlife, trample and denude vegetation, interfere with native predators, change nutrient chemistry in soils and water, and cause erosion. They may also be vectors carrying seeds of non-native vegetation and of disease that can spread to the wildlife. Dogs off leash have also been reported to injure or even kill shorebirds or other wildlife that they are able to catch. Dog owners (and visitors in general) may also disturb wildlife, trample vegetation, and cause erosion. Potential impacts on park resources are presented in more detail in the *Impact Topics* section of this document.

Dogs may also adversely affect cultural resources through digging, as well as by necessitating the requirement that an otherwise intact cultural landscape be fenced to prohibit dogs. Historically, extensive park use by dogs, resulting loss of vegetation, and erosion of soil has adversely affected cultural resources and landscapes, such as those at Fort Funston.

These effects are particularly problematic for the GGNRA, a unit of the National Park Service, an agency whose "fundamental purpose" is to conserve park resources and values (NPS 2001a, 1.4.3). (This requirement is separate from the mandate that prohibits impairment of park resources and values.)

Visitor and ranger safety

Injuries to visitors from dogs jumping on them, chasing them, or harassing/biting them are a serious concern as are injuries to rangers who rescue dogs or dog owners. In 2000, for example, fifteen dogs and two dog owners were rescued from the cliffs at Fort Funston (NPS 2001c). Two ranger injuries were reported in the course of these rescues. If dogs had been leashed, these rescues would not have been needed.

Visitors have reported being jumped on and knocked over by unrestrained dogs. The park has had complaints from people who are so frightened of dogs off leash that they avoid visiting the park entirely or visit only when least likely to encounter dogs. Even dogs on leashes can be frightening to some people, such as joggers or other dog walkers, when dogs bark at them or strain at the leash.

Visitor experience

It is possible that off-leash dog walking may be more of an "exclusive" than a shared use, although a document prepared to assess whether negotiated rulemaking was likely to succeed (Situation Assessment Report, US Institute for Environmental Conflict Resolution 2004) characterizes this as an area of disagreement among those interviewed. The reasons it may be an

exclusive use include those described above regarding visitor safety and experience. Conflicts between dogs walked off-leash and other visitors can be particularly intense along the beach areas of the park, as this area attracts large numbers of visitors, both with and without dogs, on weekends and during the summer or on warm days. Because the GGNRA manages much of the publicly accessible San Francisco Bay and ocean coastal lands in the region, park personnel attest that the increased numbers of visitors and resulting conflicts among them, which is of great concern.

Walkers, hikers, joggers, bikers, horseback riders, wildlife watchers, and those seeking a quiet and natural experience are all potentially disturbed by running, barking dogs—particularly by those that chase or harass people or wildlife. Dogs can also indirectly affect visitors by leaving waste on beaches, on trails, or near the park's aquatic resources. Although signs indicate that owners are responsible for removing their pet's waste, this rule is not always followed. The GGNRA is not alone in experiencing this problem. In Boulder, Colorado, for example, despite signs, the availability of bags and trash cans, and fines for not cleaning up after dogs, the city staff cleaned up nearly 1,500 piles of dog waste from trails in a single month (Chester 2001). In Davidson County (which includes Nashville, TN), again despite signs and waste bag repositories installed by the county, the county employees regularly clear an estimated 31 million pounds of dog waste each year (City of Nashville and Davidson County 2003). Dog waste can have an adverse impact on visitors, on resources, and on the safety of the park staff tasked with cleaning up after irresponsible owners.

Urban area issues

While the park's General Management Plan undergoes updating, its Strategic Plan (NPS 1997) acts as the most current statement of overarching park policy. The Strategic Plan indicates that the intent and focus of the GGNRA is to "bring national parks to the people," and "...strengthen the park's relevance to our metropolitan neighbors." Because the San Francisco Bay Area is highly urbanized, dog owners may have access to few outdoor areas for exercising their pets. In many parts of the Bay Area, GGNRA lands are the "backyards" of the citizens, and residents have come to expect public lands to be made available for dog walking and other recreational activities. Also, as noted above, the GGNRA manages much of the publicly accessible coastline in the area; therefore, the enforcement of laws, regulations, and policies of much of the beach and other coastal property in this highly urbanized area falls to the National Park Service. The coastal areas are highly popular parts of the Bay Area, a region whose population is currently seven million people and is expected to grow to eight million by 2020 (NPS 2003a). The expectations of an increased number of visitors, who all expect the park to conform to their recreational needs, has increased management challenges for the present and future generations.

Public confusion

As noted above, off-leash, voice-controlled dog walking has historically been allowed in some areas of the park. This unofficial policy was in effect for more than 20 years, and some visitors may remain unaware of changes or are disinclined to change their dog walking habits. This appears to be the case in some park sites where, although signs are posted indicating that all dogs must be on leash, dog owners continue to allow their dogs to run free.

Additional confusion comes from the disconnected nature of GGNRA park sites. They are interspersed among private property, as well as with lands managed by county, state, or regional

agencies. Each of these public areas has its own set of rules and regulations regarding dog walking, some of which differ from NPS regulations (see *State and Local Laws, Regulations, and Policies* in this document for more information), and geographical boundaries between agency jurisdictions may not be obvious in some cases. The public may also be largely unaware of the laws, regulations, and policies that guide the National Park Service in management of lands and resources.

Finally, the public may not understand that the function of the park compendium is to state annual closures, or that they are responsible for reading it to find out which areas are closed to dog walking (or closed to humans as well). Adding to the possible confusion, closures may change from year to year, and portions of park sites, rather than an entire site, may be closed to the public (such as Fort Funston and Crissy Beach).

Enforceability

Although current regulations specify in the Code of Federal Regulations and in the GGNRA compendium that some areas are closed to the public, and in some areas dogs are either entirely disallowed or must be on-leash, multitudes of violations occur daily. During a recent field visit in January 2005 to Fort Funston by the NEPA contractor and NPS staff, for example, tens of dogs were seen off leash on GGNRA lands despite signs stating that dogs must be on leash. In fact, one commercial dog walker was seen releasing onto Fort Funston lands his entire charge of 10 dogs. In addition, rangers indicate that many prohibitive signs at the park have either been spray-painted or illegally removed. Similar conditions, but to a lesser degree, were observed at Crissy Field. Additionally, informational cards and brochures are available for the public, and information is updated regularly on the GGNRA website and media articles often note that park areas are closed to dogs.

The NPS staff have worked to educate the public on the dog walking regulation currently in effect by distributing information cards and brochures, meeting with organized dog walking groups and asking them to inform their constituency, updating the website as needed, and even handing out free leashes for a period of time. Nonetheless, it would take constant policing of many of these areas to enforce the existing regulation, an expense most parks cannot afford. Although it is believed that most violations are committed by those knowledgeable of the rules and regulations of the area, it is also possible that public confusion mentioned above adds to the difficulty of enforcing on-leash rules.

Purpose and Need for Action

NEPA requires an EIS to briefly provide a statement of purpose and need for the action the agency is proposing. The need for action summarizes why action is required and the purpose states the goal the park must achieve by taking action. At the internal scoping session with park staff in January 2005, the following statements of need and purpose were drafted.

Need for Action

A dog management plan is needed because GGNRA resources and values, as defined by the park's enabling legislation and the NPS Organic Act, could be compromised to the extent that, without action, areas of the park might not be available for enjoyment by future generations. A history of a dog management policy inconsistent with NPS regulations and increased public expectations for use of the park for dog recreation have resulted in controversy, litigation, and compromised visitor and employee safety, affecting visitor experience and resulting in resource degradation. The conflicts would likely escalate if not addressed in a comprehensive dog management plan.

Purpose of Taking Action

The purpose of the plan produced by the EIS environmental planning and negotiated rulemaking processes is to provide a clear, enforceable policy to determine the manner and extent of dog use in appropriate areas of the park. This plan would promote the following objectives:

1. Natural and cultural resources and natural processes are protected and preserved
2. A variety of visitor experiences are provided
3. Visitor and employee safety are improved
4. User conflicts are reduced
5. Park resources and values are maintained for future generations

As noted above, the EIS planning process will evaluate several reasonable alternatives and the efforts of the Negotiated Rulemaking Committee will be integrated into this planning process. It is considered most likely that the Committee will produce all or part of at least one of the alternatives analyzed in the EIS. The analysis performed in the EIS, along with other factors, will also provide important information that must be available to GGNRA before it can identify a preferred alternative.

Objectives in Taking Action

Objectives are specific goals that describe what GGNRA intends to accomplish by preparing a dog management plan. These objectives come from a variety of sources, including existing GGNRA policy documents, NPS management policies, laws and regulations, laws and policies that dictate resource management (such as the Endangered Species Act or National Historic Preservation Act), and the dog management issues discussed above. Alternatives that will be developed as part of the NEPA process will often differ in the extent to which each of the

objectives is met. The internal scoping process yielded the following specific objectives for this planning process:

- **Adopt a dog management plan**. The current situation has been created by a regulation that is greatly at odds with the wishes of many members of the public, by frequent violations of that regulation in locations where resources may be adversely affected, and by the lack of sufficient enforcement personnel. These difficulties, combined with the reasons identified above (see *Current Dog Management Problems*), have led the park to commit to establishing a clear and enforceable set of policies in the form of a dog management plan, which may support the basis for a special dog walking regulation for GGNRA.

- **Build community support for the plan.** The use of the Negotiated Rulemaking Committee, with broad representation of all known positions on dog management, would help in building community support for this part of the planning process. Committee meetings are by law open to the public, and both the negotiated rulemaking and NEPA processes provide for public input and review requirements that would serve to inform and involve interested parties and groups.

- **Maximize dog walker compliance .** To date the park has been unable to provide the needed law enforcement personnel to enforce the NPS-wide regulation regarding dog walking. Alternatives are likely to need educational components and may require the dog walking community to be self-policing and assist the park in its efforts to protect the safety of visitors, the quality of visitor experience, and the natural and cultural resources of the park.

- **Provide adaptability and flexibility.** Resource conditions and visitor use are likely to change over time. For example, the need to provide mountain biking opportunities was not something the park had anticipated until this sport came into existence in the late 1980s. The plan must be dynamic and allow for monitoring to be able to open and close areas to dog walking as needed in order to accommodate the recreational needs of GGNRA visitors and protect park resources and values.

- **Increase public understanding of NPS policies.** The National Park Service is unable to allow certain uses of its lands or impacts on its resources and values because of the laws and policies under which it must operate. Some of these are explained in the *Laws, Regulations and Polices* section below. In general, the NPS is required to keep its resources from becoming degraded to the point that future generations are unable to enjoy them. The NPS also has many specific requirements for resource protection, safety, and other factors in its 2001 Management Policies (NPS 2001a) and its many Director's Orders (see www.nps.gov/policy for additional information). Education on national park polices is important so that the public can understand the legal and regulatory constraints that differentiate NPS land management from that of other land management agencies, and that bind the actions the park can legally take in managing dog walking.

- **Create and implement an enforceable commercial dog walking policy.** Commercial enterprise of any kind is not allowed in national parks without concessionaire contracts, fees, and/or permission from the park. The plan should be responsive to NPS policies

regarding commercial uses in parks, as well as to the growing demand for businesses using the park to provide recreation for their "clients," in this case, dogs.

- **Provide for a variety of safe, high quality, visitor use experiences, including areas where dogs are allowed.** In addition to its policies to protect resources, the NPS is also mandated to provide for the enjoyment of park resources and values, and the GGNRA has noted in its Strategic Plan (NPS 1997) that one of its main missions is to "bring parks to the people." Although visitor enjoyment is one of the fundamental missions of the NPS, conservation of park resources and values takes precedence if there is a conflict between the park's conservation and the public's right of enjoyment (NPS 2001a 1.4.3). GGNRA seeks through this plan to provide both places where dog owners are able to walk their dogs in a variety of settings and places where visitors would either never encounter dogs or would be very unlikely to do so. The park seeks to make all visitor experiences as safe and as high quality as possible.

- **Establish criteria consistent with NPS Management Policies (NPS 2001a) to determine whether and/or where dogs restrained by voice control or leashes are acceptable and where no dogs are appropriate.** It is anticipated that each alternative would consider off-leash dog walking areas, although some alternatives may find that no areas are appropriate for this use. Some alternatives may suggest time/day/seasonal restrictions, fences, or other mitigation measures to control off-leash dogs to minimize visitor use conflict and impact on park resources. Each alternative may also include the formal closure of areas previously closed annually via the compendium and the Code of Federal Regulations. As noted above, these closures take place to protect visitor safety or park resources. Although most closures have been to both dogs and humans, the alternatives may include areas off-limits only to dogs to ensure some "dog free" visitor experiences or to protect sensitive resources. These areas may be off-limits for certain times of the day, days of the week, seasons of the year, or completely closed to dogs. Alternatives may also designate areas of the park when on-leash dog use is appropriate. Because the park acquires property via donation and congressional action, establishing firm criteria for the appropriateness of dog-related activities would also help guide future management decisions.

- **Control and direct dog use with clear and enforceable parameters.** Guidance to dog walkers and to park enforcement personnel must be easy to understand and enforceable. The alternatives would include a component specifying how violations of the rules in the plan would be treated, whether and how the public's help would be solicited in enforcing rules, and how safety would be addressed for park personnel or volunteers policing areas or cleaning up dog waste.

- **Protect sensitive species and their habitat—including federal and state-listed, unique, or rare species—from the detrimental effects associated with dog use.** The alternatives would identify areas, if any, where dog use would not be allowed or would be highly restricted if it would prevent GGNRA from meeting state or federal recovery goals for sensitive and unique plant and animal species. In addition to the mandates to conserve resources and prevent their impairment, the NPS must follow the requirements of the Endangered Species Act. NPS Management Policies (NPS 2001a, sec 4.4.2.3) offer the same protection to state-listed, unique, or rare species inside park boundaries to the extent it is possible.

- **Protect native wildlife and their habitat from detrimental effects of dogs use, with no net change in the abundance of native wildlife species, amount of acreage, or function of habitat.** Alternatives in the EIS would include monitoring to ensure that wildlife or habitat in areas open to on-leash or off-leash dog walking suffer no detrimental effects, or if impacts do occur, that they are alleviated. Although mitigation of damage may be necessary, no net loss of wildlife or of habitat quality overall would be allowed.

- **Preserve opportunities for future natural and cultural resource restoration and enhancement.** The presence of dogs would not be allowed to degrade an area to the extent that park resources in that area could not be restored or enhanced. GGNRA periodically prepares cultural and natural resource management plans that list and prioritize resource management, protection, restoration, and enhancement needed. Alternatives would be checked against the projects identified in each of these plans to ensure restoration opportunities are not inadvertently lost or threatened by dog management.

- **Minimize harassment or disturbance of wildlife by dogs.** As noted above, it has been documented in a number of sources that dogs disturb wildlife under certain conditions. In particular, they chase shorebirds and can even run down and injure or kill a slowly moving bird. Dogs may also trample or disturb ground nesting birds, and the very presence of dogs can cause even cliff-nesting birds to take flight (see *Annotated Bibliography*, Appendix A). Dogs are also known to chase terrestrial wildlife, including deer and coyotes, and have been known to harass stranded marine mammals. The energy expended in escape can make animals more susceptible to loss from predation or weather and can affect reproductive success. Alternatives in this EIS may use seasonal restrictions, imposition of on-leash rules, closures or other mitigation to minimize harassment or disturbance of wildlife by dogs. The park may also use targeted studies that could detect impact of dogs on/off leash vs. people, etc. to evaluate levels of disturbance to wildlife.

- **Facilitate research to better understand and manage the effects of dog use on park resources.** Some alternatives may include provisions for seeking additional funding, especially for research that answers questions regarding impacts of dogs on park environments or helps guide future GGNRA dog management decisions.

- **Minimize degradation of soil and water resources by dog use.** Dog excrement and urine can change the chemical nature of water resources, and soil erosion from digging or excessive use can contribute to soil loss and excess turbidity. Alternatives would include measures to ensure that unique soil resources, as well as the park's streams, rivers, ponds, wetlands, and coastal resources are not adversely impacted. Mitigation measures and/or partial closures or restrictions (during the rainy season, for example) may be employed to provide this protection.

- **Share what the park learns with other parks and neighboring jurisdictions dealing with the same issues.** Many cities, counties, municipal districts, and other agencies across the country are being asked by their citizens to create opportunities for off-leash, voice-control dog walking. Each municipality is considering many of the same issues as those listed here, and some have begun programs allowing dogs off leash in portions of their managed lands. GGNRA would depend on monitoring information collected by a

variety of agencies to help create alternative plans within the EIS process and also hopes to share what it learns with other parks and agencies.

- **Monitor and use the information collected to evaluate current and future decision-making based on estimated outcomes.** Each alternative plan would have a monitoring component that would collect information on resource conditions, visitor safety, visitor experience, and other factors. GGNRA may construct an "adaptive management" alternative or include adaptive management within each alternative considered. This means specific resource conditions, visitor safety, and other desired outcomes would be defined and adjusted based upon monitoring.

- **Prevent further adverse effects to cultural landscapes, historic structures, and archeological sites from dog activities.** Dogs can affect cultural resources through digging, erosion of soils, by exposing archeological resources to erosion, or by causing the loss of culturally important landscaping. The presence of dogs may require a landscape to be fenced that had not historically been fenced. Alternatives will consider known and potential significant historic, archeological, and cultural landscape sites in determining where various dog-related activities are appropriate and will protect opportunities for future restoration of those sites.

- **Ensure safe and healthy working environment for park staff.** This objective is aimed at ensuring that staff, volunteers, and park partners who enforce dog-walking policies, rescue dogs and their owners, and remove dog waste enjoy a safe and healthful work environment. Enforcement, maintenance, interpretive, and natural resource personnel, along with park volunteers and park partner personnel are currently exposed to dog bites, verbal and even physical attacks from belligerent dog owners, and danger from rescues. Maintenance workers risk additional health hazards from waste cleanup. Alternatives would consider measures both to maintain the safety of these workers and/or to ensure punishment of dog owners who violate rules and regulations.

- **Minimize the need for enforcement**: Currently, resource management and law enforcement staff spends scarce time and resources managing dog walking at GGNRA. The Dog Management Plan would include education and the integration of public comments such that park management and enforcement would be more limited and staff resources could be allocated to other high priority resource management tasks.

- **Develop a Plan to Address New Park Areas:** As new areas are added to the GGNRA, the park must develop a management plan for these areas. In evaluating suitable uses, the issue of dog walking must often be addressed. The Dog Management Plan will spell out how to evaluate this use on new lands.

Areas of Restricted Human and/or Dog Use

Each year, parks produce a list of areas that have restrictions or are closed to visitors, including dogs, in the Superintendent's Compendium. This list is posted on the park's Web site at http://www.nps.gov/goga/plans-policies.htm. The dog management plan EIS will present information about each of these areas, including reasons why the areas have been historically restricted or closed. The park may choose to use this planning and EIS process, and any regulation that results, to restrict or close areas permanently or for a longer period of time than annually as it can currently via the compendium.

Listed below are the areas closed or restricted via the 2004 Superintendent's Compendium (NPS 2004), for reasons derived from consultation with US Fish and Wildlife Service on the requirements of the Endangered Species Act or for other reasons (such as enabling legislation). Compendium restrictions may be in place to protect cultural or natural resources, to enhance public health or safety, or to avoid conflict among visitor use activities. Brief descriptions of the reasons for restrictions or closures are given below:

- *Stinson Beach.* Stinson is the only designated swimming beach in the park and so dogs are not allowed. Leashed dogs are permitted in parking lots and picnic areas (see Table 1).
- *Tennessee Valley.* Historically dogs and people have not been permitted in the valley itself due to grazing issues. This has helped to keep wildlife habitat in better-than-average condition, and the park has chosen to keep the area closed to continue protecting wildlife and its habitat. On-leash use is allowed on the Coastal Trail that runs through the western end of the valley and the Miwok Trail just to the north of the entrance to Tennessee Valley.
- *Oakwood Valley.* Dogs must be on leash and on designated trails where they are allowed in Oakwood Valley, and the upper end of Oakwood Valley is not open to dogs at all. This is in part because of the presence of threatened mission blue butterfly habitat and because of conflicts the park has experienced between illegally off-leash dogs and coyotes. The trail ends in upper Oakwood Valley, and hikers and dogs are prohibited from traversing across habitat for the threatened mission blue butterfly to connect with other trails on the ridge above.
- *Marin Headlands.* Dogs on-leash are restricted to designated trails and beach areas in the Marin Headlands. However, parts of this area are critical habitat for the endangered tidewater goby and are important habitat for the threatened mission blue butterfly. The US Fish and Wildlife Service and the National Park Service have reached agreement through consultation via the Endangered Species Act (Section 7 consultation) on how to protect the butterfly in this area, including restrictions on travel off trail for dogs and human visitors and closures. Water quality issues are also factors in some closures. Table 1 has additional detail on specific closures in the Marin Headlands.
- *Fort Baker.* The park has closed the marina and pier for safety reasons and the Chapel Trail in the Fort Baker area to dogs to protect endangered species. The park's management plan for Fort Baker would change the pier into a public marina with food and other services.
- *Crissy Field/Presidio Area A.* Closures in Crissy Field are related to protection of shorebirds and other wildlife and protection of restored tidal wetlands, dune vegetation,

and Lobos Creek, a drinking water source. In addition, the retrieval of dog waste in areas before they were closed resulted in resource damage, such as trampling, and health issues for those volunteers cleaning the waste. In Area A of the Presidio, the area managed by the NPS, travel off the established trails is not permitted between Fort Point and Baker Beach.

- *China Beach.* This beach is closed to dogs because of its history as a swimming beach and because it covers only a very small area. Demand for dog walking in this area is very low.
- *Lands End/Cliff House.* Portions of this area are closed to the public for safety and cultural resource protection. Closures in the future could change depending on vegetative cover. Any use in the area is restricted to trails only, and cultural resources and areas of safety concern are fenced.
- *Ocean Beach.* Section 7 consultation related to plovers requires dogs be on leash for two miles of Ocean Beach over ten months out of the year. This restriction applied even during the period when dogs were allowed off-leash along the remainder of Ocean Beach. At present, the leash law applies to the entire beach but is often ignored in this area.
- *Muir Beach.* Dogs (and humans) are prohibited from entering Big Lagoon at Muir Beach or Redwood Creek because threatened fish species (Coho salmon and steelhead trout) use the lagoon and creek as habitat. Because of this, protecting water quality is particularly important. Leashed dogs are allowed on designated trails and beach areas.
- *Muir Woods.* Muir Woods National Monument is one of the two park sites managed by GGNRA that has its own separate enabling legislation. This legislation speaks to "solitude and silence" as the experience visitors should be able to have in the monument. Dogs (excluding service dogs) are incompatible with this experience and have historically been excluded from the monument.
- *Alcatraz.* Historically, dogs have not been allowed on Alcatraz and remain restricted due to the limited access (by boat only) and the many nesting water birds on the island.
- *Fort Point.* Fort Point is the other park unit managed by GGNRA that has its own enabling legislation. Dogs are prohibited inside the fort and on the pier because they would adversely affect the visitor experience of these historic resources and/or the resources themselves. The beach area west of the fort, the seawall beyond the chain fence and the Golden Gate Bridge and pylons are closed to the public for safety and bridge security reasons. Leashed dogs are allowed elsewhere at Fort Point.
- *Fort Funston.* At the southern end of Ocean Beach in the Fort Funston area, where the beach is located below a bank swallow colony, is closed during March to August to the public during most years for a distance of 50 ft. out from the base of the cliffs to protect nesting birds. These same areas are considered a potential safety hazard as use has accelerated erosion, which has in turn threatened cultural resources and wildlife habitat. The cliff areas are fenced because of these safety and resource problems. When the area is not closed (outside the nesting season), travel off established trails or allowing dogs off leash is prohibited in the bank swallow protection area and at Battery Davis. Although leashes are required when and where dogs are allowed in the Fort Funston area, most dog owners allow their dogs off leash throughout this site.
- *Milagra Ridge.* The mission blue butterfly and red-legged frogs inhabit areas of Milagra Ridge. In addition, the park has had conflicts between coyotes and off-leash dogs. Because of these problems, dogs are restricted to on-leash, on-trail use only.

- *Sweeney Ridge.* Red-legged frogs are present in parts of this area, and a unique wet meadow habitat with a high possibility of rare plants are present as well. Leashed dogs are restricted to trail use only for these reasons.
- *Phleger Estate.* The Phleger Estate is in San Mateo County is accessed only via trail through San Mateo County parkland, where dogs are not permitted. Therefore, this park site is closed to dogs.

In the remainder of GGNRA parklands, dogs are generally permitted if they are on leash. One exception is that in Marin County (because of a county regulation); the only trails open to dogs on leash are those specifically designated for pets. The park also imposes restrictions and closures on trails or other areas during the year for resource protection or to protect public health and safety when conditions warrant them. These closures are included in the next year's compendium if they are to be continued.

Table 1 below summarizes current dog management conditions, including the closures and restrictions described above, and provides historic information in the form of policies covering more than twenty years from the time the 1979 pet policy recommended by the Citizen's Advisory Commission was mistakenly put into effect by the park. It also shows areas identified as closed when the ANPR was published in the *Federal Register* in January 2002. Figures 1a and 1b, which show park sites in the north and south ends of the GGNRA respectively, also illustrate historic and current dog-walking management.

Figure 1a. Historic and current dog management in GGNRA north park sites.

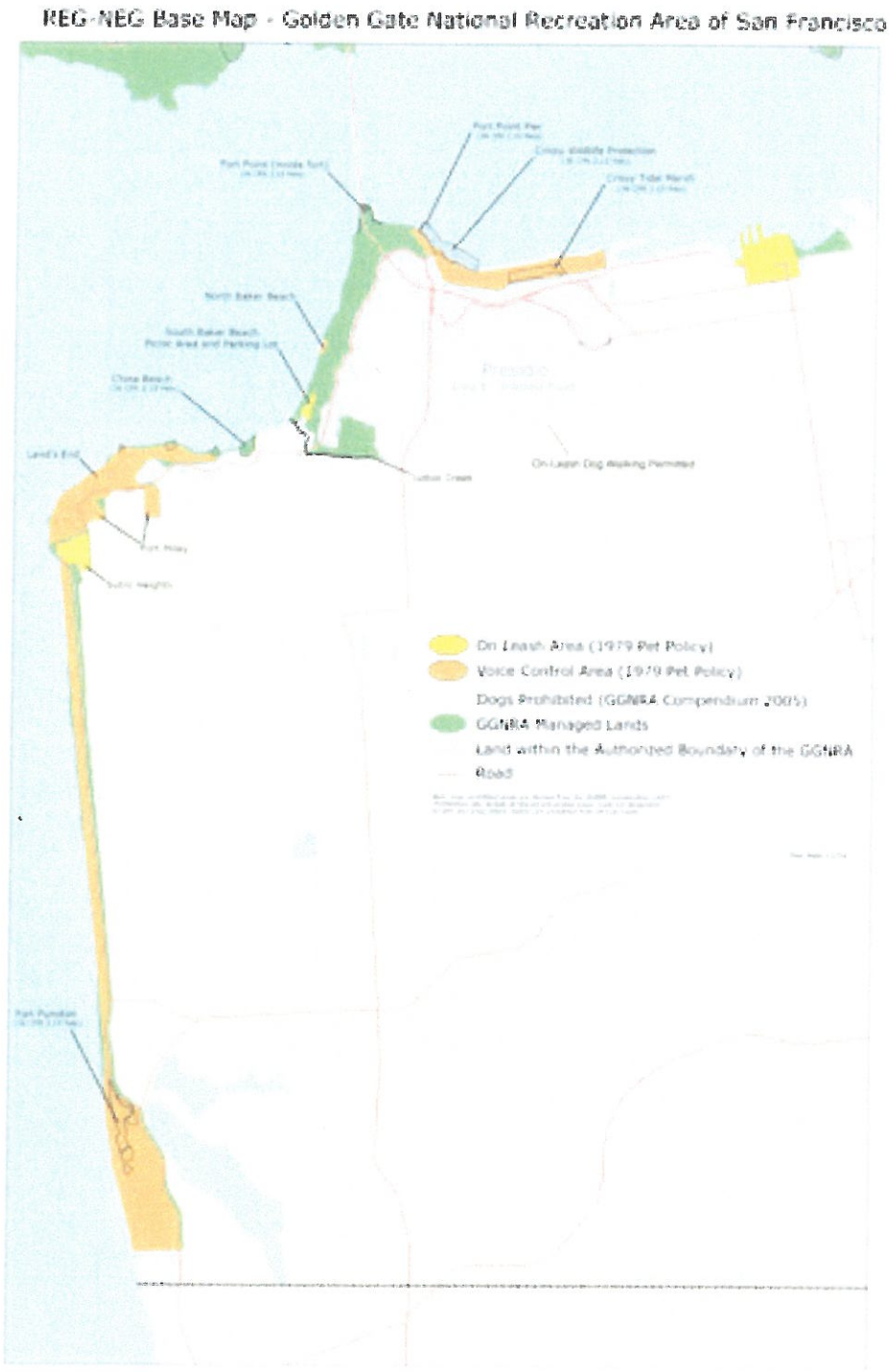

Figure 1b. Historic and current dog management in GGNRA south park sites.

Table 1. Summary of current and historic dog management in the GGNRA

Park Site	Currently allowed dog-walking areas	1979 Pet Policy	2004 Compendium	ANPR
Stinson Beach	Leashed dogs are permitted where signed.	*No pets are permitted* EXCEPT • in the restricted advanced-dog-training area in the portion of Whitegate Ranch bounded by Panoramic Hwy., State Hwy. 1 and Mt. Tamalpais State Park, southwest of Panoramic Hwy.	*Pets are prohibited (36 CFR 2.15)* EXCEPT • in parking lots and in picnic areas. • No dogs are permitted on the beach.	*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use, and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • The beach at Stinson Beach
Tennessee Valley	*Dogs are not permitted in Tennessee Valley* EXCEPT • on the Coastal Trail that cuts across Tennessee Valley. (not specified in Tennessee Valley listing). • on Miwok Trail north of Tennessee Valley.	*No pets are permitted* EXCEPT • on leash on Miwok Trail between Tennessee Valley parking area and State Route 1. • on leash on Coastal Trail between Hill 88 and Muir Beach.	*Pets are prohibited (36 CFR 2.15) in* • Tennessee Valley.	*The following areas of the park, are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use, and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • Tennessee Valley

Park Site	Currently allowed dog-walking areas	1979 Pet Policy	2004 Compendium	ANPR
Oakwood Valley, including Alta Avenue	• Leashed dogs are permitted on designated trails.	Dogs are permitted • under voice control or on leash on Oakwood Valley Road to Alta Avenue. • under voice control or on leash on Alta Avenue	The area is not specifically addressed, but the following applies to upper Oakwood Valley: *Pets are prohibited (36 CFR 2.15) on* • Trails not designated for pets	
Marin Headlands	• Leashed dogs are permitted on designated trails and beach areas. • *Dogs are NOT permitted in Rodeo Lagoon.*	Dogs are permitted • under voice control or on leash on Rodeo Beach at Fort Cronkhite. • under voice control or on leash on loop trail from parking area *(Rodeo Lagoon)* to Pacific Coast Trail to paved road near Battery Townsley and return via paved road. • under voice control or on leash on Wolf Ridge Trail between Coast Trail and Miwok Trail. • under voice control or	*Pets are prohibited (36 CFR 2.15) at* • Kirby Cove, Redwood Creek, Rodeo Lagoon, and Rodeo Lake. • trails not designated for pets. • Coastal Trail (Marin Headlands between Lower Conzelman Road and the Rifle Range) • SCA Trail) • Wolfback Ridge, between Alexander Ave. and Hwy. 101 *In compliance with Public Use Limits (36CFR1.5),*	*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use, and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • Kirby Cove Rodeo Lagoon • all fresh water bodies • endangered mission blue butterfly habitat • Redwood Creek

Park Site	Currently allowed dog-walking areas	1979 Pet Policy	2004 Compendium	ANPR
		on leash on Miwok Trail between Wolf Ridge Trail and Coastal Trail. • under voice control or on leash on Coastal Trail to junction of Wolf Ridge Trail. • under leash on Coast Trail between Hill 88 and Muir Beach. *Pets are prohibited on* • trails not designated for pets.	travel off established trails is prohibited in the following areas: • Hill 129 Trails	
Fort Baker	• Leashed dogs are permitted in designated areas. • *Dogs NOT allowed on pier.*	N/A	*Pets are prohibited (36 CFR 2.15) at* • Fort Baker Pier *Closures (36CFR1.5) are areas fenced or posted as closed:* • Battery Cavallo • Battery Duncan	*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use, and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • endangered mission blue butterfly habitat at East Fort Baker • East Fort Baker Pier

Park Site	Currently allowed dog-walking areas	1979 Pet Policy	2004 Compendium	ANPR
Presidio/Crissy Field	• Leashed dogs are permitted except in designated habitat/wildlife protection areas. • *Dogs are NOT permitted on Lobos Creek boardwalk.*	Dogs are permitted • under voice control or leashed at Golden Gate Promenade/Crissy Field.	*Pets are prohibited (36 CFR 2.15) at* • Crissy Field Tidal Marsh • Crissy Filed Wildlife Protection Area *In compliance with Public Use Limits (36CFR1.5), travel off established trails is prohibited in the following areas:* • Crissy Field dune systems--Presidio Area A • Crissy Field boardwalks—Presidio Area A • Coastal Trail at Fort Point, between Marine Drive and Lincoln--Presidio Area A • Coastal Trail from Golden Gate Bridge to Baker Beach—Presidio Area A • Coastal Trail along serpentine soil and rock garden adjacent to	*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use, and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • Crissy Beach tidal marsh and wildlife protection area

Park Site	Currently allowed dog-walking areas	1979 Pet Policy	2004 Compendium	ANPR
			WWII monument--Presidio Area A *Closures (36 CFR 1.5) are areas fenced or posted as closed:* • Lobos Creek riparian corridor—Presidio Area A	
China Beach	• *Dogs NOT permitted.*	• *No pets.*	*Pets are prohibited (36 CFR 2.15) at* • China Beach.	*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use, and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • China Beach
Fort Miley	• Dog use not specified.	Dogs are permitted • under voice control or on leash in West and East Miley.		
Lands End/Cliff House	• Leashed dogs are permitted outside buildings.	Dogs are permitted • under voice control or on leash.	*Closures (36 CFR 1.5) are areas fenced or posted as closed:* • Pt. Lobos Archeological	

Park Site	Currently allowed dog-walking areas	1979 Pet Policy	2004 Compendium	ANPR
			District *In compliance with Public Use Limits (36CFR1.5), travel off established trails is prohibited in the following areas:* • Dead Man's Point & Slide Area (Land's End) • Eagles Point (Land's End) • Painted Rock (Land's End)	
Sutro Heights	Dog use not specified.	Dogs are permitted on leash only.		
Baker Beach	Dog use not specified.	Dogs are permitted • under voice control in the north beach area. • on leash only in the picnic/parking area. • *No pets (south beach area)*		
Ocean Beach	• Leashed dogs are permitted.	Dogs are permitted • under voice control or on leash.		*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use,*

Park Site	Currently allowed dog-walking areas	1979 Pet Policy	2004 Compendium	ANPR
				and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources: • Ocean Beach (in the threatened snowy plover management area)
Muir Beach	• Leashed dogs are permitted on designated trails and in beach areas. • *NO dogs allowed in the lagoon or Redwood Creek.*	Dogs are permitted • under voice control or on leash.	*Pets are prohibited (36 CFR 2.15) at* • Muir Beach Lagoon • Redwood Creek	
Muir Woods	• *Dogs are NOT permitted.*	• *No pets.*	*Pets are prohibited (36 CFR 2.15) at* • Muir Woods National Monument	*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use, and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • Muir Woods
Homestead Valley	Leashed dogs are permitted.	Dogs are permitted • under voice control or leashed.		

Park Site	Currently allowed dog-walking areas	1979 Pet Policy	2004 Compendium	ANPR
Alcatraz	• *Dogs are NOT permitted.*	• *No pets.*	*Pets are prohibited (36 CFR 2.15) on* • Alcatraz Island	*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use, and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • Alcatraz
Fort Point	• Leashed dogs are permitted, except in historic fort. • *Dogs are NOT permitted on pier.*	• Dog use not specified.	*Pets are prohibited (36 CFR 2.15) at* • Fort Point, inside the historic fort • Fort Point Pier on Torpedo Wharf *Closures (36 CFR 1.5) at Fort Point Historic Site:* • Beach area, seawall outside chain fence • Golden Gate Bridge anchorage and pylons—Presidio Area A	*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use, and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • Fort Point Historic Structure
Fort Mason	• Leashed dogs are permitted.	• Leashed dogs are permitted.		

Park Site	Currently allowed dog-walking areas	1979 Pet Policy	2004 Compendium	ANPR
Fort Funston	• Leashed dogs are permitted except in designated habitat/wildlife protection areas.	Dogs are permitted • under voice control or on leash.	*Pets are prohibited (36 CFR 2.15) at* • Fort Funston Habitat Protection *Closures (36 CFR 1.5) are areas fenced or posted as closed:* • Battery Davis Erosion Control Area at Fort Funston *In compliance with Public Use Limits (36CFR1.5), travel off established trails is prohibited in the following areas:* • Fort Funston Habitat and Bank Swallow protection area • Fort Funston—Battery Davis	*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use, and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • Fenced coastal dunes and cliff areas of Fort Funston
Milagra Ridge	• Leashed dogs permitted.	N/A	*In compliance with Public Use Limits (36CFR1.5), travel off established trails is prohibited in the following areas:* • Milagra Ridge, west of	*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use,*

Park Site	Currently allowed dog-walking areas	1979 Pet Policy	2004 Compendium	ANPR
			Nike Missile Silos	*and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • Milagra Ridge, endangered mission blue butterfly habitat
Sweeney Ridge	• Leashed dogs are permitted.	**N/A**	*In compliance with Public Use Limits (36CFR1.5), travel off established trails is prohibited in the following areas:* • Sweeney Ridge, west side of South Meadow	
Phleger Estate	• *Dogs are NOT permitted.*	**N/A**		*The following areas of the park are precluded from consideration for off-leash uses because pets have never been allowed (e.g. there is no history of dog walking use, and/ or it has not been an issue) or pets have been restricted due to sensitivity of resources:* • Phleger Estate
Mori Point	• Leashed dogs are permitted.	**N/A**		

Background

History of Dog Management

As noted above in the *Introduction* section, GGNRA has a history that includes allowing dogs off leash and under voice control at some park sites. This policy was incorrectly established by park acceptance and implementation of a recommendation of the GGNRA Citizens' Advisory Commission, which was appointed by the Secretary of Interior to facilitate public input. The Commission's policy identified the following areas as appropriate for "voice control" of dogs (see Table 1): Fort Funston, Lands End, Fort Miley, North Baker Beach, Crissy Field, Ocean Beach, and park sites in Marin County including Rodeo Beach, Muir Beach, Oakwood Valley, Homestead Valley, Whitegate Ranch and several trails. For more than twenty years, an unofficial voice-control policy was in place at these park sites.

Since 1972, visitation to the park and the population of the Bay Area have both increased. During this period, the park experienced greater off-leash dog walking use, and as a result, increased conflict and potential for conflict among park visitors, dogs, and dog owners, as well as heightened sensitivity to this discord on the part of the visiting public. In addition, several new species with habitat inside the park were listed as threatened and endangered, requiring special protection. In 1995, formal consultation under the Endangered Species Act required the park to enforce the existing leash regulation in snowy plover habitat on Ocean Beach and to develop a snowy plover management plan.

Underscoring the conflict over off leash dog use, dog walking groups filed a lawsuit against the NPS in March 2000 when the GGNRA decided to close part of the Fort Funston area to the public to provide resource protection. In particular, the park wanted to protect new nesting locations of the state's threatened bank swallow community; increase biological diversity by restoring coastal native dune scrub habitat; increase public safety by keeping visitors and their pets away from cliff areas; and protect geological resources, including the bluff top and interior dunes that had been subject to accelerated erosion by humans and dogs. The park discussed a 12-acre closure with interested groups, including both environmental and off-leash dog walking interests and, based on discussions, slightly reduced the closure to ten acres. Upon initiation of the ten-acre closure, the lawsuit was filed. The Federal District Court held that the NPS had not adequately obtained public input on the proposed closure. Upon completion of public involvement efforts, the Court agreed that the GGNRA had fully complied with required sections of the Code of Federal Regulations (36CFR1.5) and that the need for "prompt protective action" was "genuine." The park closed the original twelve acres in February 2001. This lawsuit brought to light the fact that the voice control policy then in effect was contrary to NPS regulations.

On January 23, 2001, the GGNRA Citizens' Advisory Commission acknowledged publicly that the 1979 voice-control policy was null and void because it violated the NPS regulations. This was at least partially prompted by complaints from non-dog walking park visitors about their fears or negative experiences with unleashed dogs.

The park realized it needed to enforce existing NPS pet regulations, but in response to increasing controversy regarding this issue, the park also proposed potential future management options for public comment via an ANPR (Advanced Notice of Proposed Rulemaking) in early 2002. The notice asked the public whether they would like the NPS to consider other options for dog management at GGNRA and put forth two alternatives for comment—Alternative A, which

would continue to enforce existing NPS regulations that dogs be allowed only on leash, and Alternative B, which would begin the analysis and eventual rulemaking to allow specific off-leash use areas. Alternative A indicated the park would consider allowing *leashed* dogs in some areas where they are not currently permitted. These included Stinson Beach, Fort Baker Pier, Phleger Estate, and portions of Tennessee Valley. The ANPR further invited the public to comment on a number of specific management questions, including which areas should be closed to dogs, which areas should be fenced, which areas should allow dogs walked on leash, and which should allow dogs under voice control. It also asked how the number of dogs should be limited, how to ensure the park was not liable for injuries caused by or to dogs, and what the potential environmental impacts of the alternatives might be.

After duplicates were removed, the park found it had received 8,580 comment documents on its notice. In August 2002, a public comment analysis summary was published in a report by Northern Arizona University (Social Research Laboratory 2002a). Nearly three-quarters of those responding, or seventy-one percent, selected Option B. Of these, the great majority were residents of San Francisco (88 percent of 4,222 comment documents). Those visitors from out of state overwhelmingly voted for Option A (96 percent of 1,186 comment documents). Fort Funston, Crissy Field, and Ocean Beach were the sites most frequently mentioned by both those preferring Option A and Option B.

As noted above, the ANPR also asked for comments beyond whether or where off-leash dog walking should be allowed. The following suggestions were received from the public:

- Separate off-leash dog walking from other visitor uses, and designate specific areas, days, and times when off-leash dog walking is allowed.
- Fully enforce whatever regulations result, but do not assume all dogs owners are irresponsible if violations occur and that areas need to be closed to dogs.
- Create a licensing process for dogs to demonstrate voice control.
- Fence environmentally sensitive areas or fence off-leash areas.
- Limit the number of dogs per person, on- or off-leash.
- Encourage volunteer efforts to assist in stewardship of off-leash areas.
- Educate the public about how to control dogs and about the impacts dogs have on park resources.
- Monitor the impacts of dogs and report every few years.

Additional input on public opinions was obtained through a random phone survey of Bay Area residents. The survey design was initiated during the ANPR public comment period in Spring 2002 (Social Research Laboratory 2002b); the survey was conducted from May to July 2002. These residents were from the four counties surrounding GGNRA. More than 70 percent indicated support for the current NPS regulations regarding walking dogs on-leash "at most sites in the GGNRA," and prohibiting off-leash dog walking at any park site. However, 40 percent were strongly or somewhat in favor of allowing off-leash dog walking at some GGNRA sites. Nearly three-quarters of those responding believed off-leash dog walking should be allowed "only in limited areas" of the park. Notably, although 88 percent of San Francisco commenters—the largest group of commenters—on the ANPR (or "notice" described above) supported Option B or off-leash dog walking in some park sites, the phone survey found that only 46 percent of San Francisco County residents did so.

Following the summarizing of public input and other technical information, a panel of senior federal officials from outside the GGNRA was convened to recommend to the Superintendent of the GGNRA whether the park should proceed toward rulemaking to allow some off-leash dog walking or whether the present on-leash policy of the NPS should remain in effect. The panel concluded that off-leash dog walking in this urban park may be appropriate in selected locations where:

- Adverse impacts to park resources could be adequately mitigated.
- Public safety incidents and public use conflicts could be appropriately managed.

The panel also recommended that the park pursue both rulemaking and comprehensive planning for pet management to address suitable locations and proper management strategies. Appointing a third party to act in collaboration in the planning or rulemaking process was identified as an option.

During a press conference in October 2003 and also in a letter to interest groups in May 2004, GGNRA announced its intent to initiate a negotiated rulemaking effort with the initial step of a situation assessment, to determine the potential for a successful negotiated rulemaking effort. To manage this initial step, the park had worked with the U.S. Institute for Environmental Conflict Resolution to contract with a neutral mediation team. The invitation letter to groups who had a "demonstrated interest in and commitment to GGNRA dog management issues" noted that the neutral team would act as a third party in helping to "investigate a regulation to allow off-leash dog walking in certain areas...where resources and visitor safety would not be impacted."

The neutrals spoke with more than fifty people in individual and group interviews during the summer of 2004. The goals of the interviews were consistent with the Negotiated Rulemaking Act:

- Identify key interests of key individuals and organizations who would be significantly affected by a rule and would need to be represented for a committee to be balanced,
- Identify the potential for consensus through the negotiated rulemaking process, and
- Identify prospective candidates who were able and willing to serve on the committee.

The results of interviews are published in the Situation Assessment Report (Center for Collaborative Policy and CDR Associates, 2004). Substantive and procedural interests related to off-leash dog walking, points of agreement and disagreement among those interviewed, and key variables and unknowns were identified. The mediators arrived at the following conclusions:

- There is a need for a rule.
- There are a limited number of identifiable interests that will be significantly affected by the rule.
- There is a reasonable likelihood that a committee can be convened with a balanced representation of people who are willing to negotiate in good faith to reach a consensus on the proposed rule.
- There is a reasonable likelihood that a committee will reach a consensus on a proposed rule within a fixed period of time.

- The negotiated rulemaking procedure will not unreasonably delay the notice of proposed rulemaking and the issuance of a final rule.
- The agency has adequate resources and is willing to commit such resources, including technical assistance, to the committee.
- The agency, to the maximum extent consistent with rules, regulations, and policies will use the consensus of the committee as the basis for a proposed rule for notice and comment.

As noted above, this latter bullet means that if the Committee comes to consensus on where and under which circumstances off-leash dog walking might be appropriate in the GGNRA, and it is considered reasonable by the NPS (within the laws, regulations, and policies identified below; meets the objectives, purposes, and needs identified above; and is considered generally feasible to implement), these recommendations would likely become a part of the preferred alternative. As of December 2004, suggestions for members of the Negotiated Rulemaking Committee were submitted to the Director of the NPS and to the Secretary of the Interior, and a notice that such a committee is being formed will be published in the *Federal Register* following the Secretary's approval.

In late January 2005, specialists in all fields, including law enforcement, resource management, visitor use and experience, maintenance, interpretation, and park management met to draft the purpose, need, and objective statements to identify existing management problems and to begin drafting possible solutions in the form of conceptual alternatives. This "internal scoping" is a process that can take many months and usually ends with publication in the *Federal Register* of a notice regarding the intent to prepare an EIS and to hold public input sessions. Since negotiated rulemaking also requires that meetings be open to the public and has other, similar fact-finding requirements that overlap with those of the National Environmental Policy Act, the concurrent completion of both processes will help avoid duplication of effort.

Laws, Regulations, and Policies

The GGNRA is guided by a variety of legal directives, including laws, regulations, policies and plans, legal agreements, Director's Orders, and decisions made through other NEPA planning processes. Perhaps foremost among these directives is the *Organic Act of 1916* and its interpretation in the *NPS Management Policies (NPS 2001)*. Park units also turn to their enabling legislation to determine the park's significance (unique features), purpose (why the unit was established as a park unit), and mission.

NPS Organic Act and Management Policies

By enacting the National Park Service *Organic Act of 1916 (the Organic Act)*, Congress directed the U.S. Department of the Interior and the NPS to manage units "to conserve the scenery and the natural and historic objects and wild life therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations" (16 USC. § 1). Congress reiterated this mandate in the *Redwood National Park Expansion Act of 1978* by stating that NPS must conduct its actions in a manner that will ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress" (16 USC § 1a-1).

Despite these mandates, the Organic Act and its amendments afford the National Park Service latitude when making resource decisions that balance visitor recreation and resource preservation. By these acts, Congress "empowered [the National Park Service] with the authority to determine what uses of park resources are proper and what proportion of the parks resources are available for each use" (*Bicycle Trails Council of Marin v. Babbitt,* 82 F.3d 1445, 1453 [9th Cir. 1996]).

Because conservation remains its predominant mandate, the NPS seeks to avoid or to minimize adverse impacts on park resources and values. Yet, the NPS has discretion to allow negative impacts when necessary (*Management Policies 2001*, sec. 1.4.3 [NPS 2001a]); however, while some actions and activities cause impacts, the NPS cannot allow an adverse impact that constitutes resource impairment (*Management Policies 2001,* sec. 1.4.3 [NPS 2001a]). The Organic Act prohibits actions that permanently impair park resources unless a law directly and specifically allows for the acts (16 USC 1a-1). An action constitutes an impairment when its impacts "harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values" (*Management Policies 2001,* sec. 1.4.4 [NPS 2001a]). To determine impairment, the National Park Service must evaluate "the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts" (*Management Policies 2001,* sec. 1.4.4 [NPS 2001a]). The Management Policies require that these determinations, and all planning decisions in the Service, be based on current scientific and scholarly understanding of park resources and ecosystems (sec 2.3.1.5). The NPS Management Policies also have separate chapters on the appropriate management of the parks and their resources (e.g. wilderness, natural resources, etc.).

Park units vary based on their enabling legislation, natural resources, cultural resources, and missions. Management activities appropriate for each unit and for areas within each unit vary as well. An action appropriate in one unit could impair resources in another unit. Thus, this

environmental impact statement will analyze the context, duration, and intensity of impacts related to dog management only within Golden Gate National Recreation Area, as well as the potential for resource impairment, as required by the NPS NEPA regulations and handbook (Director's Order 12: Conservation Planning, Environmental Impact Analysis and Decision-making; NPS 2001d).

Golden Gate National Recreation Area Laws and Policies

Golden Gate Enabling Legislation

The Golden Gate National Recreation Area was established by Congress in 1972 (PL92-589). The language of the enabling legislation states the park's purpose as follows: "In order to preserve for public use and enjoyment certain areas of Marin and San Francisco Counties, California, possessing outstanding natural, historic, scenic and recreational values and in order to provide for the maintenance of needed recreational open space necessary to urban environment and planning, the Golden Gate National Recreation Area is hereby established." The hearing records pertinent to the enabling legislation reveal that the future use of the park was the subject of considerable discussion. The nearby presence of several million people provided an unprecedented opportunity to make national park resources and programs available to a wide variety of visitors, many of whom had not been able or willing to access the more remote national parks. Based on the record, this "parks to the people" idea was clearly intended by Congress and the administration to be a major purpose of the GGNRA (NPS 1980).

The enabling legislation also requires that the park and its visitors "utilize the resources in a manner which will provide for recreation and education opportunities consistent with sound principles of land use planning and management," and that the recreation area be preserved "as far as possible in its natural setting" and protected from uses that would "destroy the scenic beauty and natural character of the area."

The Golden Gate National Recreation Area General Management Plan

The GGNRA *General Management Plan (NPS 1980)* is combined with that for Point Reyes National Seashore, which adjoins the GGNRA. The general management plan is a document that ensures that decisions made for each park achieve the park's purpose as cost-effectively and consistently as possible. The joint General Management Plan (GMP) notes that the resources in these two park units would be of outstanding significance even if they did not exist at the fringes of a great city. Together, these two parks represent one of the nation's largest coastal preserves—more than 100,000 acres of "superlative North Pacific Coast landscape." This has since grown to more than 150,000 acres. The GMP goes on to say that "in spite of the outstanding quality of the scenic, natural, and historic resources" in the GGNRA, it may be the "sharp contrast" between the intensively developed urban environment of San Francisco and the park's adjacent and undeveloped areas that make it particularly unique. It points to the chance to view wilderness quality scenery, headlands that are much like they were when gold-seekers first viewed them a century ago, and the chance to be removed "from the sights and sounds of man" by only a short hike (NPS 1980) as examples. This wide variety of resources and outdoor settings provide opportunities for a "correspondingly diverse array" of recreational and educational activities of "a

quality and character found nowhere else." Both GGNRA and Point Reyes National Seashore are currently updating their GMPs. The GGNRA GMP will be finalized in approximately 3 years.

Management objectives in the GMP that are relevant to dog management include the following:

- Maintain and restore character of natural environment lands by maintaining the diversity of native park plant and animal life; identifying and protecting threatened and endangered plant and animal species, marine mammals, and other sensitive natural resources; controlling exotic plants; and checking erosion whenever feasible.
- Retain the current character of cultural resources pending completion of detailed resource management plans.
- Offer recreational opportunities to a diversity of park users and impart knowledge necessary for full enjoyment of park resources through a particular emphasis on interpretation, education, and information programs.
- Develop facilities and programs that respond to the special needs of senior citizens, the handicapped, and cultural and ethnic minorities.
- Plan facilities to offer a wide variety of uses.
- Retain opportunities for recreational activities pursued in the park today.

Balance the responsibility of meeting the needs of park visitors with the need to protect the interests of residents in adjacent communities.

Golden Gate National Recreation Area Strategic Plan

The park's Strategic Plan (NPS 2005) identifies outcomes it needs to achieve to effectively and efficiently accomplish its mission. The Strategic Plan includes the following language regarding the significance of the park:

- The special combination of geologic and climatic factors in the park "have spawned 19 separate ecosystems containing 2,456 species of plants and animals. The fragile and fragmented habitats protected by the park provide a place of last refuge for almost 100 rare, threatened and endangered species...." This extraordinary natural diversity is preserved in "close proximity to 7 million residents in the SF Bay Area..."
- The park preserves "an extraordinary region of convergence where land and water, city and nature, fog and sun, wildlife and human all meet."
- The park protects a diverse cluster of landscapes and historical sites
- The park is a "culturally vibrant and recreationally dynamic center" with an array of recreational, educational and other activities.
- The park provides opportunities for thousands of people to participate in the stewardship, restoration and interpretative activities

General Management Plan Amendment (GMPA), Presidio of San Francisco/Presidio Trust Management Plan (PTMP)

This plan for the Presidio of San Francisco (NPS 1994) is an amendment to the GMP for the GGNRA. The GGNRA legislation ensured that if the military deemed the Presidio in excess of its needs, jurisdiction would be transferred to the NPS. In 1989, the Presidio was designated for closure, and in 1994, the U.S. Army transferred the Presidio to the NPS. The GMPA described

the NPS proposal for the future of the Presidio within the context of the GGNRA, and provided guidelines for management, use, and development of the overall site. In 1996, two years after the NPS adopted the GMPA, the Presidio Trust Act gave jurisdiction of the 1,168-acre inland area known as Area B to the Presidio Trust, and established new management and other requirements for Area B. The GMPA assumed that the Presidio Trust would be established under the Department of the Interior with the NPS retaining primary responsibility for the Presidio's management. Instead, Congress created the Presidio Trust as a wholly-owned federal government corporation, transferred the Secretary of the Interior's administrative jurisdiction over Area B to the Presidio Trust, and required conformity only with the purposes of the GGNRA Act and with the general objectives of the GMPA. In 2002, the Presidio Trust approved the Presidio Trust Management Plan to update and succeed the GMPA as it applies to Area B. The PTMP EIS acknowledges that the NPS is currently engaged in a process that could ultimately lead to a rulemaking procedure to develop new pet management regulations for the GGNRA and that the Trust is closely monitoring this rulemaking process and "will give future consideration to its regulation regarding dogs once the GGNRA rulemaking process is concluded" (Volume II, p. 4-225).

The GMPA remains the management plan for Area A. Management objectives in the GMPA that are relevant to dog management include the following:

- Provide for safe and enjoyable recreational use of the Presidio.
- Identify and protect sensitive wildlife species, and restore and maintain their habitats.

Other Federal Regulations, Laws and Policies

The National Park Service is also governed by the following laws, regulations, and management plans relevant to this planning effort.

- **National Environmental Policy Act, 1969, as Amended**
  Section 102(2)(c) of this act requires that an environmental impact statement be prepared for proposed federal actions that may significantly affect the quality of the human environment or for major federal actions with controversial effects.

- **National Parks Omnibus Management Act of 1998 (NPOMA)**
  NPOMA (16 USC 5901 et seq.) underscores NEPA in that both are fundamental to National Park Service park management decisions. Both acts provide direction for articulating and connecting resource management decisions to the analysis of impacts, using appropriate technical and scientific information. Both also recognize that such data may not be readily available, so they provide alternative options for resource impact analysis should this be the case. Specifically, NPOMA directs the NPS to use the findings of science and the analyses of scientifically trained resource specialists in decision making.

- **Code of Federal Regulations, Revised July 1, 2001**
  Title 36, Volume 1 (taken from section 5 of NPS 2002), provides the regulations "for the proper use, management, government, and protection of persons, property, and natural and cultural resources within areas under the jurisdiction of the National Park Service." Chapter 1, section 2.15, lists the regulations regarding pets in a unit of the NPS. These include the current regulation under which the GGNRA operates: Pets must be in a crate, cage, restrained on a leash not more than six feet in length, or otherwise physically

confined at all times. Leaving pets tied and unattended, allowing them to make "noise that is unreasonable," or failing to comply with pet excrement disposal conditions established by the superintendent are prohibited. Section 2.15 also affirms the authority of the NPS to destroy dogs that are in the act of injuring wildlife, livestock, or humans and to impound, charge fees for kenneling, or offer for adoption pets running-at-large after holding them for seventy-two hours.

- **Endangered Species Act of 1973, as Amended**
  This act requires all federal agencies to consult with the Secretary of the Interior on all projects and proposals having potential impact on federally endangered and threatened plants and animals.

- **Migratory Bird Treaty Act and Executive Order 13186**
  The Migratory Bird Treaty Act of 1918 makes it unlawful to kill, capture, buy, sell, import or export migratory birds, eggs, feathers or other parts. The January 2001 executive order 13186 restated the value of migratory birds and directed agencies to develop and implement memoranda of understanding (MOU) with the US Fish and Wildlife Service to protect them. The NPS MOU remains in draft form, but would require park units to restore and enhance migratory bird habitat and support conservation of migratory birds.

State and Local Laws, Regulations, and Policies

The park regulations and policies that follow are currently in effect or are being developed for future application:

- **California State Parks**. In the immediate area, six parks are available for recreation, including the 2,600-acre Samuel P. Taylor and the more than 5,000-acre Mount Tamalpais State Parks. Limitations on dog walking in state parks in the Bay Area are similar, but more restrictive than those described above in 36CFR 2.15 for national parks. Dogs are not allowed to be loose, and must either be in an enclosed vehicle, tent, or pen or be on a leash of not more than six feet. Unlike the GGNRA regulations, even leashed dogs are generally not allowed on trails. Visitors with vicious, dangerous, noisy, or disturbing animals are ejected from park units.

- **Midpeninsula Regional Open Space District** This district west of U.S. Highway 280 stretches from Los Altos in the south to San Carlos in the north, and consists of more than 50,000 acres and 25 open space preserves. For most district lands where dogs are allowed (nine preserves), and especially near any water body, within 50 feet of other visitors and within 100 feet of visitor facilities, dogs must be on leashes no longer than six feet. However, the district recently changed its dog access guidelines to allow the use of 25-foot retractable leashes in some areas. In addition, dogs are allowed off leash at the 17.5-acre Pulgas Ridge Reserve.

- **East Bay Regional Park District.** This district, which recently updated their dog regulations, manages 95,000 acres and more than 1,000 miles of trails in Alameda and Contra Costa counties. Over 90 percent of the district's lands are managed as natural and open parklands. Dogs are allowed to run at large under the control of their owner within many undeveloped areas of the district as long as owners have a leash in their possession

and their dogs are "kept under control at all times." Dogs are prohibited on swimming beaches, near wetlands, or near designated nature study sites but are allowed into developed areas such as campgrounds and picnic areas if they are on a six-foot leash. A list of sites available to on-leash dogs, along with those closed to dog use, is maintained on the district's Web site (www.ebparks.org).

- **Marin County.** Marin County has two separate sets of rules for its parks and open space departments. Leashed dogs are permitted at all County of Marin parks except McNear's Beach, Paradise Beach, and Stafford Lake. Dogs are permitted without leash, but under direct and immediate control at portions of McInnis Park and Upton Beach at Stinson Beach. Where dogs are allowed on leash, the leashes must be no longer than six feet and "under the direct and immediately control of a responsible person." Dogs are not allowed to bother visitors or chase wildlife. Dog owners are prohibited from leaving their pets tied to domestic trees or plants or leaving them unattended in a vehicle without adequate ventilation (10.06.010). In the county's open space district, the same restrictions apply as in state parks, except that dogs under voice control are permitted off leash on fire protection roads. The county currently owns 1,300 acres of parks and open space for recreation.

- **Marin Municipal Water District.** This district owns about 18,000 acres of watersheds and reservoirs and plans to acquire additional lands to enlarge its system. Dogs are permitted on leash but are not allowed to enter, wade, or swim in any stream or reservoir or enter within the high water mark of any reservoir.

- **San Francisco Recreation & Park Department.** Generally, dogs are required to be on leashes no longer than six feet in San Francisco city parks. However, the department recently (2002) revised its dog-walking policies and established several new "dog play areas" (DPAs) where dogs are allowed off-leash. Some of these DPAs are fenced and others use natural barriers such as topography or shrubbery. All have a minimum area of 10,000 square feet and have fenced off or have signed any sensitive habitat or resource sections where dogs are prohibited. Currently, the city maintains nineteen DPAs and has invited citizens to propose additional sites using criteria developed by the department. San Francisco Recreation and Parks Department has 227 properties and 3,300 acres under its management.

- **San Mateo Parks and Recreation.** In San Mateo, dogs are not allowed in any county park or on any county trail.

- **San Francisco PUC.** Walking of domestic pets is prohibited within peninsula watershed lands with the exception of guide, search and rescue, and police dogs.

Issues and Impact Topics

A preliminary list of issues and impact topics was developed at the internal scoping meeting with NPS specialists and their contractors. This list will be further reviewed and scrutinized by the park, its consultants, and the public and will eventually become the list of subjects or impact topics that will be analyzed in the EIS. The specialists used a screening form to determine which resources might experience more than minor adverse or beneficial impacts. The form was also used to aid in determining whether the appropriate NEPA document should be an environmental impact statement (EIS) or an environmental assessment. Because several factors that normally trigger significant effects are present, the group confirmed that an EIS was appropriate to evaluate dog management options at the GGNRA. Impact topics are summarized below in the order they appear on the screening form.

Geological resources- soils, bedrock, streambeds, etc.

1. Issue: Dog and human overuse of areas may result in trampled vegetation, soil erosion, uncovering paleontological resources, or other loss. Dogs can also increase existing erosion through digging.

Site specifics: Soils at the Fort Funston area show evidence of erosion from overuse. In addition, the cliffs at Fort Funston have experienced erosion and some breakage from dog and/or human use. It has been necessary to erect fences around areas of dune vegetation (at Crissy Field, for example) because of concerns over the potential loss of vegetation, subsequent erosion, and loss of dune sand. Although it has not been known to occur at the park, dogs could theoretically uncover fossils through digging or through accelerated erosion.

2. Issue: Dog waste adds nutrients to soils that affect its characteristics.

Site specifics: Some soils in the park are particularly unique or are by nature low in nutrients. The entire ecology of an area starts with the type and nutrient level of soil. If enough dog waste is left unrecovered, it can begin to change soil characteristics over a noticeable geographic area. A change in soil chemistry often translates into a change in vegetation, wildlife habitat, and wildlife species.

Park Soundscapes

3. Issue: The natural sounds available in the GGNRA are a positive and valued park resource, as well as a component of the visitor experience, which dog barking may interrupt.

Site specifics: Soundscapes within the park provide a variety of seasonally changing visitor experiences that are important to some park users as a refuge from the noise of the urban environment. An example is the spring bird song that is most prevalent in more remote areas and along riparian and forested habitats. Subtler experiences—lapping waves, frog choruses—may also enrich the visitor experience. Potential disturbances from barking dogs may change the natural character of the area and the overall visitor experience. The raucous sounds of a disturbed wildlife community—birds and small mammals giving alarm calls—also add to the disruption of the visitor's experience of the soundscape. The natural soundscape may also be important aside

from the visitor's experience of it, as wildlife may depend on it for successful communication with others of its species, escape from predators or other dangers, protection of young, etc.

Water Quality or Quantity

4. Issue: Dogs playing in lakes, streams, wetlands, and coastal areas can increase turbidity, and dog waste can increase nutrient levels or pathogens.

Site specifics: Research indicates that dogs playing for even a short time in a creek or pond can greatly increase turbidity levels. Smaller sediments can stay suspended for several hours (East Bay Regional Parks Fisheries Department, n.d.) and can disrupt fish feeding, particularly for visual feeders like trout and salmon (salmonids). Two known salmonids (Coho salmon and steelhead trout) inhabiting the streams and lagoons in the GGNRA are federally threatened species. High turbidity has also been linked to very low numbers of freshwater benthic fauna and their lack of diversity (EB Regional Parks Fisheries Dept., n.d., n.d.a).

Canine feces may contribute to increased nutrient levels and resulting changes in freshwater habitats within the GGNRA, including some habitats that support listed species such as the California red-legged frog *(Rana aurora drayton)*. As with terrestrial habitats, changes in nutrient levels in aquatic environments can alter the type and growth of vegetation and the ability of wildlife to continue to use the area for habitat. For example, emergent aquatic vegetation along the edge of watercourses and wetlands provides critical habitat for some listed species, and disturbance of this vegetation from dog play, such as trampling or dislocating amphibian egg masses, could compromise its value to wildlife.

As noted in the section Human Health below, dog feces may also transmit a variety of pathogens via water contamination.

5. Issue: Dogs or dog waste can infect wildlife and vice versa

Site specifics: Water-borne pathogens, such as *Canine parvovirus,* may be transmitted through dog feces to marine and terrestrial mammals (Barrett et al. 2004; see discussion under "Impacts of Diseases of Wildlife Species"). Subsequent infection of members of other species can spread the pathogen throughout a population and into its habitat.

Marine or Estuarine Resources

6. Issue: Dog waste can increase nutrient levels, and dog play can trample vegetation, benthic invertebrates, and increase turbidity.

Site specifics: Crissy Field, Rodeo Lagoon, and Big Lagoon are examples of marine or estuarine resources that may be adversely affected by dog activities. As in terrestrial environments, vegetation and soils may be eroded or otherwise lost or may be changed by the addition of dog waste, and wildlife habitat and species may be altered as a result. Specific impacts to estuarine fauna at the GGNRA include those from turbidity and increased nutrient impacts on Coho, steelhead, or other fish nurseries, and on critical reproductive habitat for the federally endangered tidewater goby known to occupy Rodeo Lagoon. Potential types of impacts to coastal species, such as bank swallows and western snowy plovers, are discussed below under Species of Special Concern.

Wetlands

7. Issue: Dog waste can increase nutrient levels, and dog play can trample vegetation, increase turbidity and destroy or alter wildlife habitat.

Site specifics: Wetlands can serve numerous functions, including helping to moderate flooding and pollution and providing wildlife habitat. Structural diversity in wetland vegetation provides cover, food, and reproductive habitat for many species in the park, including federally listed species like red-legged frogs. Dogs can frighten wildlife in these areas and can also destroy or disturb habitat to the extent that wildlife move away or fail to reproduce.

Vegetation, including rare or unusual vegetation

8. Issue: Through intensive and prolonged use, dogs may reduce the abundance and diversity of native plant communities, resulting in the loss of rare or unusual plants (see below for listed species). Disturbance of soils may influence native plant propagation, establishment, and viability and promote colonization by non-native, invasive species.

Site specifics: Plant species may suffer direct impacts from trampling and off-trail use of dunes and other fragile habitats. For example, the San Francisco Bay spineflower *(Chorizanthe cuspidate var. cuspidate)* and the San Francisco wallflower *(Erysimum franciscanum)* are rare species that may require or benefit from the protection offered by a substrate undisturbed by humans and dogs.

Understory is an important wildlife habitat component of many tree and shrub-dominated plant communities (such as the riparian coastal scrub) within the GGNRA. Unleashed dogs running into the understory to retrieve balls or simply to explore the scentscape may adversely affect the structure of the plant community and reduce its value as wildlife habitat for nesting songbirds, such as Swainson's thrush or California quail, amphibians, or small mammals.

Species of special concern (federal and state listed species or species proposed for listing)

9. Issue: Habitat used by federally threatened or endangered species may be vulnerable to impact from intensive use of public areas by humans and dogs.

Site specifics: The Biological Assessment for the GGNRA lists well over one hundred special status species that are known to occupy the planning area. Of about forty listed plant species, four are federally listed as endangered: Presidio manzanita *(Arctostaphylos hookeri ssp. ravenii)*, Presidio clarkia *(Clarkia franciscana)*, Marin western flax (*Hesperolinon congestum*), and San Francisco lessingia *(Lessingia germanorum)*. Habitat for each exists in patches of coastal scrub, prairie, chaparral, and dunes that have become increasingly rare and whose existence has been compromised by events caused by both humans and nature. Many human-caused events, including dog walking, have had a negative impact and require mitigation to protect unique and protected animal species.

For example, the colony of bank swallows (R*iparia riparia)* at Fort Funston has been cordoned off to reduce human impact on the coastal bluffs and dunes that provide nesting habitat for this

state-threatened species. The GGNRA began proactive management of the bank swallow colony in 1990, following ranger observations of destructive visitor activities, such as climbing the cliffs to access nests and carving graffiti in the soft sandstone, harassment of birds by dogs, and by visitors with rocks and fireworks.

Protection of habitat for one endangered or threatened species will often provide added protection for others associated with the same habitat type. For example, limitations on access to the Fort Funston dunes may also protect the San Francisco Bay spineflower (*Chorizanthe cuspidate var. cuspidate)* and locally rare wildlife species of concern, including California quail (*Callipepla californica*), burrowing owls (*Athene cunicularia*), and brush rabbits (*Sylvilagus bachmani*).

Use of some sandy beach areas by the western snowy plover *(Charadrius alexandrinus nivosus)* has also required seasonal restrictions on the access of dogs and humans to protect this federally-threatened species. Recent use of the restricted beach area at the west end of Crissy Field by snowy plovers illustrates the benefit of providing threatened wildlife with refuge areas that are off-bounds to dogs.

Dog waste can also contaminate aquatic habitats used by threatened or endangered species, including tidewater gobies and red-legged frogs, and dogs can trample habitat used by these or other listed species.

Unique or important wildlife or wildlife habitat

10. Issue: Intensive dog use of an area could disrupt its use by wildlife or degrade the habitat, resulting in a multitude of possible negative consequences for wildlife and population viability.

Site specifics: The adverse effects of intensive dog use can range from direct disturbance, such as chasing and flushing wildlife or disrupting nesting and foraging sites, to less direct or less obvious influences from physical disturbance (trampling) of habitat, degradation of water quality, dog-walking visitors feeding wildlife, and scent intrusion into predator territory.

11. Issue: Dog feces may transmit disease to wildlife.

Site specifics: As discussed under the section Water Resources above, dog feces have been implicated in the transmission of canine distemper virus (CDV) to marine mammals. The literature also references canine sources of disease to wild populations of foxes, coyotes, skunks, weasels, otters, raccoons, and members of the cat family, most of which occur in the GGNRA.

12. Issue: Habitat for rare, unusual, or sensitive non-listed and/or monitored species may be affected by dog use of specific areas through disturbance, displacement, and habitat alteration (see above material for listed species of special concern).

Site specifics: Effects similar to those described above for other wildlife, vegetation, and listed flora and fauna would occur for rare or sensitive non-listed species. Intensive human or dog use of an area occupied by unique or sensitive species may trample vegetation, alter or erode soils, or simply frighten wildlife away from their habitat. This effect may occur even if the species does not reside in the park year-round, as some wildlife are highly vulnerable to any disturbance or even slight changes in habitat.

Examples of species that are not listed as threatened or endangered but are still considered rare are those named by the California Natural Diversity Data Base (CNDDB), the California Department of Fish and Game (CDFG), or the California Native Plant Society (CNPS). Wildlife that is not rare within an environment but is rarely seen by visitors, such as the American badger, the bobcat, and the mountain lion may also be disturbed or displaced by dogs. Similarly, the activities of dogs can distress other species that may be common elsewhere but are increasingly rare in the Bay Area, such as the California quail (*Callipepla californica*) and brush rabbits (*Sylvilagus bachman)*. (California quail now survives in only a few isolated patches of habitat within San Francisco and is the subject of a Save the Quail campaign by the Golden Gate Audubon Society.) Specialized habitat beyond that described above—wetlands, estuaries, and riparian areas—includes shorebird roosting and foraging areas, marine mammal haul-out areas, traditional colonial water bird roosts (such as that of the black-crowned night heron), rare native plant communities, and refuge habitats.

Shorebirds and shorebird habitat for about thirty species that occur regularly exists along the shore of San Francisco Bay. The bay supports more shorebirds than any other wetland on the Pacific Coast and is home to the majority of individuals of the thirteen most abundant species that occur here. Resting and feeding habitat can be particularly important to migrating shorebirds, and in some spots in the GGNRA, where humans and dogs are absent, flocks consisting of thousands of roosting or migrating individuals congregate.

Abundant literature suggests that shorebirds unaccustomed or unable to acclimate to human or dog disturbance will either repeatedly flush when approached or will no longer reside in a site. This bird behavior can result in energy loss, morbidity, reduced reproductive success, or death.

Unique, essential, or important fish or fish habitat

13. Issue: As noted in other sections of this report, dogs can increase turbidity and nutrient levels in water and can trample vegetation and other fish habitat.

Site specifics: Estuaries, wetlands, and freshwater streams, rivers, and lakes can all be home to rare or otherwise important fish species in the Bay Area. Fresh and brackish water environments in the GGNRA are habitat for the two threatened salmonids, Coho salmon and steelhead trout, and the endangered tidewater goby. As previously noted, salmonids are visual feeders, and extended periods of high turbidity following dog play in ponds or creeks can result in their reduced foraging time or success. Although a study of the effects of turbidity on fish in a section of Redwood Creek found that turbidity did not reduce the number of trout, turbidity was positively correlated with a reduction in their average size (East Bay Regional Fisheries Department, n.d.a).

The habitat of the federally-listed, endangered tidewater goby (*Eucyclogobius newberryi*) can also be affected by dogs playing in water, as dogs may crush breeding burrows that male gobies dig in the spring after their lagoon habitat closes to the ocean (UWFWS 2004a).

The level of nutrients in a water body can have a direct effect on the type and abundance of vegetation or invertebrate food in an aquatic environment. Since these are the elements of fish habitat, dog waste or dog play can adversely affect both fish and fish habitat.

Introduce or promote non-native species

14. Issue: Dogs can be carriers of exotic plant seeds, and unleashed and escaped or abandoned dogs can become feral.

Site specifics: As noted above, dogs can introduce non-native bacteria or viruses as pathogens to other wildlife. They can also spread non-native plant seeds brought in from outside the park or spread plant seeds from one area of the park to another through their fur and digestive tracts. In addition, nutrients from dog waste can alter soil characteristics to favor non-native species over native vegetation. Abandoned or escaped dogs can also become feral, essentially acting as a non-native animal species that displaces other dog-like predators, such as foxes or coyotes and preying on native species.

Recreational resources, including supply, demand, visitation, activities, etc.

15. Issue: Dog walking can be viewed as an exclusive use of recreational resources.

Site specifics: For some recreational users, such as hikers, wildlife watchers, beachgoers or those who seek a natural or primitive experience, the presence of a barking dog, a dog off leash, or a dog otherwise not under control can be enough to ruin the experience or cause the recreational users to find alternative locations for relaxation. Although the impact of dogs upon recreational resources should be limited to trails or areas where leashed dogs are allowed, leash laws are frequently violated. Because of this violation and because some areas are overused, impacts to soils, vegetation, wildlife, natural quiet and other park resources that visitors might wish to experience in a natural state are more widespread.

Visitor experience and aesthetic resources

16. Issue: Dog-walking visitors and visitors without dogs often come into conflict.

Site specifics: Walkers, hikers, joggers, bikers, horseback riders, wildlife watchers, and those seeking a quiet and natural experience are all potentially disturbed by running, barking dogs. Those dogs that are off leash and are chasing or harassing visitors or wildlife, or dogs in the park's rivers, streams, wetlands, marshes, or the ocean may particularly disrupt a visitor's experience. Visitors to the GGNRA also indicate (see Social Research Laboratory 2002 for more detail) that even leashed dogs may be intimidating or too aggressive for comfort. Additionally, dogs may adversely affect the aesthetics of the park by leaving waste on beaches, trails, or near water resources. Although signs indicate that dog owners are responsible for picking up their pets' waste, this is not always done.

Human health

17. Issue: A health concern associated with dog waste is pathogens, which can infect humans if ingested.

Site specifics: Organisms carried in dog feces, such as *Cryptosporidium, Giardia lamblia*, and *Salmonella* can induce symptoms ranging from skin sores to chest pain. *E. coli*, which causes diarrhea and abdominal gas, has been the source of disease outbreaks in several states (EPA

2001). Particularly virulent strains of *E. coli* can cause serious illness and fatalities. *Cryptosporidium* is of particular concern because it is highly resistant to disinfection with chlorine. This protozoan causes gastrointestinal illness lasting two to ten days in healthy individuals, but can be fatal in people with weakened immune systems. Dog waste can also contain roundworms and other parasitic nematodes, which can cause fevers, bronchitis, asthma, or vision problems in severe infections. Infections of any of these pathogens can take place through ingestion of contaminated sand, vegetation, or water.

Archeological Resources

18. Issue: Dogs can expose archeological resources by digging or through causing soil erosion.

Site specifics: Dogs could potentially uncover buried cultural resources by digging them up, although this may be quite unlikely over most of the park. If an area is known to have a high density of archeological resources, it may be a candidate for closure to dogs. Dogs can also accelerate erosion of soils through trampling and loss of vegetation. In the extreme, this can lead to exposure and loss of buried cultural resources.

Prehistoric/historic structures

19. Issue: The presence of dogs inside historic or prehistoric structures is inconsistent with the value of these structures because dogs may adversely affect structures through play, digging, or defecating.

Site specifics: Valuable prehistoric or historic structures in the park may be delicate and unable to withstand dogs playing or jumping on them. Restored structures are prized for their historic accuracy, and dogs are not a part of that history. Defecation or urination could also harm buildings or building materials over time.

Cultural Landscapes

20. Issue: The presence of dogs in most of the cultural landscapes in the park may detract from the value of the landscape.

Site specifics: Cultural landscapes are combinations of elements including landscaping, buildings, views and other natural features that truly represent to or suggest a particular event or time period. For example, the farms and fields at Gettysburg create a scene that is similar to that at the time of the historic Battle of Gettysburg. Dogs on or off leash would be inconsistent with the importance of all or most of the cultural landscapes at the GGNRA, so pets may need to be restricted from those considered most important to the park.

Park Operations

21. Issue: Park staff, time, and money is needed to manage any existing or future dog policy.

Site specifics: As noted above, managing current dog walking policies in the park requires a great deal of staff time to police frequent violations, to rescue dogs and their owners, and to pick up dog waste that owners fail to remove. The cost to the park of providing dog stations, dog waste bags, and personnel to remove dog waste not removed by walkers impacts park operational

budgets. Personal protective equipment must be provided to park personnel to provide a safe working environment, further affecting lean park budgets. The GGNRA is undertaking the negotiated rulemaking process partly in the hope that owners who deliberately defy rules because they have no legitimized off-leash dog walking areas in the park will obey them if these areas are provided. Alternatives may also encourage volunteer policing by dog walkers at different park sites.

Socioeconomics

22. Issue: Professional dog walkers are conducting their business and need business permits.

Site specifics: People desiring to conduct business in a national park are required to obtain permission from the park through an authorization/permitting process and fee payment in order to operate legally. Fees provide for cost recovery in maintaining dog walking authorizations/permits and maintenance. Professional dog walkers currently bring their dogs to park sites for exercise every day but have not obtained authorizations/permits and are not paying fees. There is no proof of general commercial liability insurance, no proof of automobile insurance, no valid business licenses provided, and indemnification from injury caused by walked dogs is not provided.

23. Issue: Social values, or opinions about how park resources should be managed, will vary and some will be adversely affected regardless of the management choices made by the park.

As noted in the *Background* section, public opinion in the Bay Area is split on how parklands should be managed regarding dog walking. More than 70 percent of individuals responding in a 2002 phone survey indicated support for the current NPS regulations regarding walking dogs on-leash "at most sites in the GGNRA," and prohibiting off-leash dog walking at any park site. However, 40 percent were strongly or somewhat in favor of allowing off-leash dog walking at some GGNRA sites. Nearly three-quarters of those responding believed off-leash dog walking should be allowed "only in limited areas" of the park. It is anticipated that a Reg-Neg process would help in fleshing out these social values in more depth.

Minority and low-income populations

24. Issue: It is possible that minority or low-income populations are more strongly affected by off-leash dog walking.

Site specifics: It is unknown, but is the object of speculation, that minorities or low-income people are more inclined to avoid park sites where dogs are off leash. The phone survey conducted in 2002 by Northern Arizona University (Social Research Laboratory 2002) separated data by race and income, as well as other variables, and found slightly lower support from low-income families for allowing off-leash dog walking in the GGNRA. The survey indicated that 14 percent of respondents with incomes lower than $50,000 strongly supported off-leash dog walking, whereas 21 percent of those with incomes from $50,000 to $100,000 and 23.5 percent of those with incomes over $100,000 strongly supported it. Racial differences were even more apparent, as only about 25 percent of African-American respondents either strongly or somewhat supported off-leash dog walking, whereas 38 percent of white and 35 percent of Asian-Americans did so.

Other agency plans and policies

25. Issue: Dog management policy at GGNRA may impact or influence policy at other regional parks—municipal, state, and federal.

Site specifics: Some regional parks within the California State Park System and the open space areas of San Mateo County as well as the entire National Park System have more restrictive dog-use policies than those currently employed at the GGNRA. If dog-use policy is relaxed in the GGNRA, it may result in pressure to reduce restrictions in other parks, exposing them to negative impacts from dogs similar to those suffered at the GGNRA. More lax regulations on GGNRA lands may also attract visitors with dogs from other areas that have more restrictive policies, such as the Presidio Trust, for example. Such a concentration of dogs and dog owners within the lands of the GGNRA would amplify their negative effects on the park.

Urban quality, gateway communities

26. Issue: Open spaces for recreation add to the quality of the urban environment, but the park must serve a variety of urban visitor needs.

Site specifics: Because the San Francisco Bay Area is highly urbanized, dog owners may have no facilities or only minimal provisions for exercising their pets out-of-doors. In many parts of the Bay Area, the GGNRA lands serve as the back yards of the citizens, and residents have come to expect that these lands are be available for dog walking and other recreational activities. Also, as previously noted, the GGNRA manages much of the coastline in the Bay Area, so the enforcement of laws, regulations, and policies of much of the beach and other coastal property in this urbanized area falls to the National Park Service. These factors result in a high concentration of diverse visitors, along with their variety of activities and expectations on park lands, and leads to conflicts among them. Uses that are particularly controversial, such as off-leash dog walking, may require separation from other uses through closures or temporal, seasonal, and daily restrictions or other mitigation.

Long-term management of resources or land/ resource productivity

27. Issue: Dog use can damage resources that cannot be restored.

Site specifics: As noted in other sections of this report, overuse by dogs or humans can result in the loss of irreplaceable archeological resources and can change the character of soils, vegetation, wildlife habitat, and the species of wildlife themselves. If these areas are affected by intense use over a long period of time, or if natural resources are particularly vulnerable to change or damage, the impact caused by dogs can preclude an opportunity for restoration.

Dog health

28. Issue: Wildlife may transmit disease to dogs, and the quality of water where dogs play or drink may be poor.

Site specifics: Uninfected dogs may pick up canine distemper virus and other diseases from infected wildlife. Wild birds, small mammals and other dogs can also introduce microorganisms

into a water supply and algal blooms or other naturally occurring phenomena can make uninfected dogs sick when they drink from these streams or ponds.

Preliminary Alternatives

The specialists at the internal scoping sessions in January 2005 were asked to brainstorm preliminary alternatives for a park dog management plan. To encourage them to create a variety of options, they were separated into five smaller groups and asked to represent what they believed to be a particular point of view, such as that of dog owners and commercial dog walkers, visitors concerned with environmental preservation, visitors who did not walk dogs, and so on. The staff was reminded that any reasonable alternative they suggested must fulfill the purpose of the park plan, resolve needs, meet all stated objectives to a large degree, and conform to written laws and policies, with the exception of 36 CFR 2.15, which only allows for dogs when on-leash, or otherwise constrained. It is important to note that the groups did not always follow the rules in creating their alternative and that they were given only a short time for this exercise. They also admitted gaps in their knowledge about attitudes various interest groups might hold on the issues or how the plan's objectives should be addressed. Therefore, their concepts are presented for information only.

A subset of the NPS groups at the internal scoping meetings, called the interdisciplinary team (IDT), will continue to meet to refine these concepts and begin to assess the adverse and beneficial impacts of the various options. Public input is also important in further development of management plan alternatives. The IDT will continue to create additional alternatives so that the EIS meets the NEPA requirement of analyzing a *full range* of reasonable options.

Common to All Action Alternatives

In beginning to assess how and where dog walking can be managed in the park, the small groups considered the areas historically closed to dogs as a "planning constraint." That is, areas within the park that have never been open to dog use (whether on or off leash), would remain closed. The reasoning behind this is simply that those areas have not been found appropriate for dogs, (and in some cases, people) for a variety of reasons as stated in the explanations in the "background" section of this report, "Areas Closed to Dogs/Human Use." The majority of Tennessee Valley, for example, has never been open to dogs, and in some cases, people, because of its unique wildlife habitat values. Introduction of dogs in such areas would in effect be an introduction of a non-native species, with undesirable consequences, such as waste and scents, potentially interfering with native species behavior. Other areas, such as Stinson Beach, is the only designated swimming beach in the park; therefore, opening that area for consideration for dog walking would be inappropriate and have potential visitor use conflicts that do not exist today. The small groups were instructed to use the 2002 ANPR and 2004 compendium closures as a "parameter" (see Table 1) and to consider those closed areas and not within the options for dog use. To a large degree, the groups adhered to these parameters.

Alternative A- No Action

All environmental impact statements must include the analysis of the No Action alternative. When the action is to create or update a management plan, No Action implies the continuation of current management. This guidance comes from the Council on Environmental Quality (CEQ) regulations regarding NEPA (40 CFR 1500). CEQ notes that it would be "a useless academic

exercise" to construct and analyze an alternative of no management at all, so the No Action alternative should be thought of "continuing the present course of action until that action is changed." Action alternatives, as described below, are then compared to the No Action alternative to determine relative impacts.

Baseline management is described in other locations in this document and is briefly summarized here. The park is currently attempting to enforce 36 CFR 2.15, which requires that dogs be caged, crated, or restrained in vehicles or on leashes no longer than six feet at all times in all units of the National Park Service. Dogs are prohibited, as are people, from areas listed in the Superintendent's annual compendium, as well as those identified in the section *Areas Closed to Dogs and/or Humans*. Otherwise, dogs are allowed on leash at all park sites. Off-leash dogs are not allowed at any park site and have not been allowed so since January 2001.

Enforcement personnel attempt to patrol all park sites to ensure compliance with this and all other regulations for park use. However, resources are spread thin and are inadequate to ensure that dogs are kept on leash throughout the GGNRA. Violations occur particularly at historic voice-control sites, such as Fort Funston and Ocean Beach.

Alternative B

This alternative would use the 1979 pet policy as its guide in deciding where off-leash dog walking is appropriate (see Table 1 for the 1979 pet policy restrictions). Dogs off leash and under voice control would be permitted at the following locations:

- Crissy Field, except at the marsh and wildlife protection area.
- Baker Beach, north of the Fort Scott overlook only (for security reasons).
- Ocean Beach, except for the 2.2 mile snowy plover closure.
- Fort Funston, except for 12 acres along the beach; no seasonal closures.
- Fort Mason.
- Oakwood, except in fenced areas.
- Marin Headlands, except for one trail that is now closed; all trails where on-leash dog walking is now allowed would permit off-leash dog walking.
- Fort Baker Pier and the parade ground.
- Muir Beach except for Big Lagoon.
- Mori Point.

On-leash dogs would be allowed on trails in Tennessee Valley.

Overall, Alternative B was geared to ensure no net loss of off-leash dog walking acreage once it was allowed in the above areas. Therefore, it would include a provision that the park must open a similar area, in both size and visitor experience, if it closed one of these areas to off-leash dogs. Surveys of other visitors would be conducted to determine when and where the highest user conflicts occur, and time or day restrictions would be applied, if needed, to avoid them. Dog-free days might also be necessary for particularly crowded conditions, such as a summer weekend beach day. Criteria for determining whether dogs should be allowed off leash in the future would

relate to congestion. In uncongested areas, dogs should be allowed off leash, but in congested areas, or during times of the day or week when congestion was usually high, keeping dog on leash would be appropriate.

No criteria were developed or consideration given to times when areas should be completely closed to dogs. Small sensitive areas would be fenced in the off-leash dog walking sections listed above. However, areas park personnel consider dangerous, but that dog walkers are willing to explore, such as the cliffs at Fort Funston, would be left unfenced. Dog owners would assume liability and rescue expenses in these areas. If larger areas proved sensitive to off-leash dogs, they could be closed temporarily to recover and then reopened. The park would be required to consult with dog walkers before closing areas for resource protection, including protection of cultural resources, and adequate scientific information to prove the need would be required before a closure was deemed permanent.

Communication between the park staff and dog walkers would take place on a routine basis, both through the use of written newsletters or other media and through meetings between park law enforcement staff and dog community leadership. Public meetings would be held to help dog walkers and other visitors understand rules and regulations and the reasons behind them. Dog walkers would also help to organize waste pickups to assist park personnel. The number of dogs per walker would be limited to no more than six.

Alternative C

This alternative would maximize the protection of park resources, even if opportunities for the dog walking public were diminished. It would assume that the NPS regulations governing dog management in park units (36 CFR 2.15) are the norm and would establish criteria based on resource values and potential impacts for opening areas to off-leash dog walking, on-leash dog walking, or closing areas altogether. The type of criteria would include the potential for resource damage to an area, its sensitivity to ongoing cumulative impacts, and the uniqueness of the resource. However, this alternative would also consider visitor use and conflicts among visitors, as well as safety, and would explore mitigation or separation of visitors as a means of allowing limited use of an area for dogs under voice control. The resource and visitor conflict criteria would then be applied to current areas where dogs are allowed on-leash to see if management should be changed. Monitoring of resources in questionable areas or of mitigation practices to see if they are working would be critical in deciding whether the criteria need to be modified or dog management should be altered at specific park sites.

Newly acquired park sites would remain closed to dogs until a resource inventory could be taken and park specialists could apply the criteria and decide on appropriate dog management policy.

Commercial dog walkers would be charged a business use fee, and the money would be used to restore natural and cultural resources affected by dogs. No dog walker would be allowed to walk more than three dogs at any one time.

No specific areas were designated in this alternative, as the criteria must first be developed and then applied. It is anticipated that criteria for off-leash dog walking would be more stringent than for on-leash dog walking and that all areas historically closed to dogs would remain so.

Alternative D

This alternative would add a few areas for off-leash dog walking but would generally maintain existing conditions. All bodies of fresh water—such as creeks, wetlands, and ponds—would be closed to dogs. Areas where resource values are high would either be closed, or open only if dogs are leashed and remain on trails. Neighboring parks and public land managers would be involved in the planning and implementation of this alternative. Monitoring and adaptive management to protect resources and to avoid visitor conflicts would be part of this alternative as would criteria to evaluate dog management in future land acquisitions. Commercial dog walkers would be required to obtain a permit and pay a fee, and the number of dogs any one person could bring onto a park site at one time would be limited to between three and five.

Except for those areas identified below, dog management would remain as it is now, with compendium closures in place and dogs allowed only on leash in the remainder of the park. Dogs would be allowed off leash in the following areas:

- Muir and Rodeo Beach, during the hours of 7 a.m. to 9 a.m.
- Baker Beach, north of the sand ladder.
- Crissy Airfield, in rotating fenced areas (rotation is designed to protect resources).
- Ocean Beach, from stairwell 26 to Cliff House on weekdays.
- Fort Funston Beach.

Additional closures to dogs would include these areas:

- Any body of fresh water, including Oakwood Valley Pond, Redwood Creek, and others.
- Fort Funston to Sloat Boulevard.

Criteria for closures and for dog walking both on- and off-leash would be developed and used to evaluate dog management strategies on any acquired lands. Park sites would be monitored and dog management policies reevaluated where impacts and visitor use conflicts are different than originally expected.

Alternative E

This alternative would consider some off-leash dog use where resource impacts would be negligible. It would also keep most on-leash areas the same as they are now, with the exception of a few closures to protect known resources. All existing closures would remain.

The Phleger Estate, which is closed because access to it is through San Mateo County open space lands where dogs are prohibited, would be formally closed via the dog management plan. Portions of Mori Point would be closed where data show the presence of red-legged frogs or migration corridors for the federally endangered San Francisco garter snake. In addition to the existing closure of wildlife protection areas at Crissy Field, dogs would be prohibited from the east beach area to avoid visitor conflicts and to protect resources. The Coastal Trail between Rodeo and Muir Beaches would also be closed to dogs to protect shorebirds and other coastal wildlife as would portions of Ocean Beach from Fort Funston to Sloat Boulevard. Dogs would not be permitted in any freshwater body, such as creeks or ponds, or any wetland or estuary.

Areas considered for opening to off-leash dogs would include the following:

(As noted in other portions of this report, the term "off-leash" is synonymous with "under voice control," and owners would be required to demonstrate voice control of their dog(s) if asked by park law enforcement personnel.)

- Portions of Mori Point.
- Portions of Milagra Ridge.
- Portions of Fort Funston, swale near parking lot to Battery Davis and the beach below Funston.
- Portions of Ocean Beach, from Stairwell 26 north to Cliff House on weekdays.
- Portions of Baker Beach, north of sand ladder.
- Portions of Crissy Field, possibly on central beach west of lagoon entrance and on airfield.
- Portions of Fort Mason, including Great Meadow on weekends.
- Portions of Fort Baker, although the pier and battery would remain closed.
- Portions of Marin Headlands, along Rodeo Beach from crest of beach to ocean.
- Portions of Muir Beach, from the crest of beach to the ocean.
- Portions of Oakwood Valley, in the meadow.

Where it is uncertain, additional information would be collected to determine whether these areas have sensitive or unique resources before off-leash dogs would be allowed. Monitoring to verify negligible impacts would take place, and dog management would change if needed based on the results.

The remainder of the park would be open to on-leash dogs only. These include the following locations:

- Unclosed areas of Sweeney Ridge.
- Trails at Fort Funston.
- Ocean Beach, from Sloat Boulevard to Stairwell 26.
- Baker Beach, including the sand ladder and south, parking lot, picnic areas.
- Promenade of Crissy Beach.
- Fort Mason, with exceptions noted above.
- Smith Guthrie loop.
- Mitchell/Bunker trails, from Rodeo Beach, through Townsley, to Marine Mammal Center.
- Parking lots/picnic areas of Muir Beach.
- Oakwood Valley loop trail.

Alternative F

The focus of this alternative is on the specific protection of wild or domestic animal life. It would use zoning and public education to ensure compliance. Each zone would have specific dog-management uses clearly defined. Zoning would be based on resource and impact information as well as research and monitoring. Alternative F would likely result in large areas of the park completely closed to dogs to protect wildlife and large areas available for on-leash use only. Some areas for off-leash dog walking would be designated, although demonstrated voice control would be tested frequently in these areas. This alternative would prioritize dog management decisions in areas where visitor use conflicts are the greatest: Crissy Airfield, Crissy Beach, Fort Funston, Ocean Beach, Fort Mason, and Rodeo Lagoon.

Generally, off-leash dogs would be allowed in portions of park sites where wildlife habitat is very low quality and/or the area is devoid of wildlife. These could include Crissy Airfield, some parking lots, sites that are normally vegetated but where vegetation is now lacking, road segments that have been closed to traffic, and the like. It is also possible that some areas that have been historically overused and now have very low resource value, such as portions of Fort Funston, would be set aside as sacrifice areas for off-leash dog walking.

Dogs would be restricted to trails in undeveloped areas of the park, and they would be prohibited altogether where other important animal resources exist, such as rare or unique wildlife species or their habitat. This alternative would also make use of restrictions for dog use in time of day, day of the weak, season of the year, manner of use, and so forth, to minimize negative impacts.

Affected Environment

The *Affected Environment* section of an EIS is intended to be a brief but complete description of resources and values that might be affected in a positive or negative way if any of the alternatives were implemented. It is particularly important to describe the current status of these resources and values in both a local and regional context, if needed, to fully understand the impacts. The NPS specialists, their consultants, and the public are key reviewers of draft topics that might be discussed in the *Affected Environment* or *Environmental Consequences* sections of an EIS. The section in this Scoping Report titled *Environmental Impact Topics* generally summarizes those resources the NPS staff initially believed would experience more than minor effects from dog-management activities. However, this list will be refined and changed by staff and by consultants. It will then be presented to the public and, in this case, will also be available to the Negotiated Rulemaking Committee.

Study Area and Scope of Analysis

To the extent that a resource is affected by the alternative actions identified in the plan, all park resources in the GGNRA are the subject of this analysis, regardless of their current dog walking status. As noted in the descriptions of several of the preliminary alternatives, it is likely that criteria would be developed and applied to park sites to determine their management. Monitoring and additional research would be ongoing, and dog management may change if applying the criteria does not result in the intended outcome in terms of resource protection, avoidance of visitor conflict, or insurance of safety. The Negotiated Rulemaking Committee may be used to help in identifying areas where off-leash dog use is appropriate or in developing mitigation or other measures, such as daily, hourly, or seasonal restrictions, to moderate impacts to visitors from off-leash dog walking. It is anticipated that none of the areas identified in the 2004 compendium or 2002 ANPR (see Table 1) as closed would be available for off-leash dog walking.

Sources of Information

An annotated bibliography is attached to this Scoping Report as Appendix A. The primary focus of references in this appendix is wildlife, and additional information on the potential for impact to other natural, cultural, socioeconomic, recreational, and visitor use resources will need to be gathered from park files, the literature, or other locations to complete the EIS.

Environmental Consequences

The NPS is required not only under NEPA but also by the National Parks Omnibus Management Act (NPOMA) to make every effort to obtain all information critical to decision making or eliminate parts of the decision, such as pieces of the dog management plan, if the information needed for decision making is unavailable. If the park feels it must go forward with decisions without having the data it would ideally like to have, it must rely on the best available information. This means, for example, that the park may turn to the published literature on the impacts of dog walking in other parks if it lacks completed research on the effects of dog walking on resources at GGNRA park sites.

Analysis Requirements

The NPS NEPA regulations (Director's Order 12) require parks to analyze systematically the impacts of each alternative in terms of its context, duration, and intensity for all affected resources. All applicable contexts should be analyzed to understand the impacts of dog walking. For example, the degree of dog-related recreation at the GGNRA compared to surrounding open space areas is one context, and the degree of dog-related recreation compared to other national parks is another. Both are important in fully understanding impacts.

The intensity of impacts is measured using defined thresholds in an NPS EIS or environmental assessment. Several examples of thresholds in NPS NEPA documents, or in documents available to parks and their consultants, provide guidance in setting these thresholds, but each park must make these determinations for each project or plan it considers.

One example of thresholds presented to the NPS specialists at the January 2005 internal scoping meeting concerned impacts of personal watercraft use on species of special concern. The thresholds for increasing intensity of impact were as follows:

Negligible impacts. No observable or measurable impacts to species, their habitats, or the natural processes sustaining them would occur. Effects would be of short duration and well within natural fluctuations.

Minor impacts. Impacts are detectable but would not be outside the natural range of variability and are not expected to have any long-term effects on species, their habitats, or the natural processes sustaining them.

Moderate impacts. Impacts on species, their habitats, or the natural processes sustaining them are detectable and could be outside the natural range of variability for short periods of time. Population numbers, population structure, genetic variability, and other demographic factors for species may have short-term changes but would be expected to rebound to preimpact numbers and remain stable and viable over the long term.

Major impacts. Impacts on species, their habitats, or the natural processes sustaining them are detectable and could be outside the natural range of variability for long periods of time or permanently. Population numbers, population structure, genetic variability, and other demographic factors for species may undergo large declines over a short period of time, with population numbers significantly depressed.

Through consultation with resource experts, literature, best professional judgment, and other factors, the IDT will develop impact thresholds for each resource affected by the alternatives. The impact thresholds will then be used to determine if the magnitude of effect of each alternative on a particular topic is 'negligible adverse, or beneficial, or of increasing intensity all the way to major adverse or beneficial. Intensity will also be measured in terms of short and long term duration.

Impairment

Based on the information discovered in the NEPA process and other factors, the park is then required to make an "impairment finding" for each alternative and each resource. As previously noted under the discussion of the NPS Organic Act, parks are prohibited from impairing resources. The NPS Management Policies (NPS 2001) have helped in defining what impairment would mean for parks. In the example of major impacts, **impairment** would be defined as:

> Major, adverse impacts that would contribute to the deterioration of the park's species of concern wildlife resources and values to the extent that the park's purpose could not be fulfilled as established in its enabling legislation; would affect resources that are key to the park's natural or cultural integrity or opportunities for enjoyment, or would affect the resource(s) whose conservation is (are) identified as a goal in the park's general management plan or other park planning documents.

Cumulative Actions and Impacts

Cumulative impacts result from actions taken inside and outside the GGNRA (e.g., cumulative actions) that affect the same resource as a GGNRA dog management plan would. For example, as noted above, public open space and recreational options, including dog walking, are available in jurisdictions that adjoin the GGNRA. If one or more of these jurisdictions were to change its regulations to prohibit dog walking, increased use and cumulative impacts on GGNRA resources might result. Cumulative impacts can come from actions that are completely unrelated to dog walking as well. For instance, development in the Bay Area is removing habitat for wildlife species (see *Human Population Increase*), and is lowering the quality of remaining habitat through the presence of humans and human activity. If the presence of dogs disturbs and displaces these same wildlife species, there is an additive, or cumulative, effect on those species.

Several parks in the Bay Area have been monitoring the health of various resources, such as air and water, and are in the process of compiling their information in a Vital Signs monitoring plan (NPS 2003a). The monitoring plan is more specific to cumulative actions and impacts in the eight park units that make up the San Francisco Bay Area Network (SFAN) although it summarizes regional problems as well. The following content is taken from the Vital Signs report:

Cumulative Actions on Affected Resources in the Bay Area

Water Quality Degradation

In the SFAN, water quality is a high profile issue because of the network's proximity to a large urban area. Water quality concerns include external sources of pollution, inappropriate use by

park visitors, atmospheric deposition (stream acidification), the effects of water pollution on park ecosystems and water use, and the loss of aquatic biota. Industrial, agricultural, and recreational pollution each threaten the parks' water resources. The Norwalk virus, for example, contaminated shellfish and sickened over 100 people in Tomales Bay in 1998. Where streams originate outside park boundaries, changes in water quality, particularly in the nitrogen and phosphorus content, can be indicative of agricultural fertilizer use or signal a reduction in productivity and/or vegetative cover upstream. Organic chemical content may indicate land use changes upstream, especially changes in mining or industrial activity. Inorganic chemicals, such as pesticides and industrial waste, also negatively affect aquatic biota. Increased acidity in aquatic systems can raise concentrations of dissolved aluminum, which is toxic to native aquatic and terrestrial biota.

Water Quantity Alteration

Streams, lakes, wetlands, and groundwater resources can be altered by impoundments, water withdrawal, expansion of impermeable surfaces in watersheds, climate change, loss of riparian buffers, and changes in runoff characteristics under various vegetation conditions. Water transport and diversion are also significant stressors manifested in changes in sediment deposition and erosion, meander patterns, flow regimes, and long-shore transport. These changes can affect stream flow response to weather events, aquatic and terrestrial species, and recreation and aesthetics. Impermeable surfaces and other products of urbanization can increase downstream flow extremes and contribute to habitat loss and fragmentation. Water level fluctuations in ponds, wetlands, and stream discharge are directly linked to groundwater levels and hydrology, which influence vegetation dynamics. Groundwater may be the significant water source for certain riparian systems, wetlands, and municipal water supplies, such as sole-source aquifers. Altered water quantity can also affect water quality, flooding events, and water temperature profiles. Both terrestrial and aquatic ecosystems are affected by these alterations, which, in turn, can lead to erosion or sedimentation, habitat degradation, non-native species invasions, riparian and wetland habitat loss, and decreased biodiversity.

Human Population Increase

The metropolitan centers of San Francisco, Oakland, and San Jose are currently home to seven million people and are forecast to have a population of eight million by 2020. Population increase inevitably results in increased use and sometimes in land use change. For the parks, this includes pressures from adjacent lands as well as activities inside parks, such as trampling of sensitive plant communities, compaction of soils, creation of social trails, and excessive impact on caves, wetlands, and other sensitive ecosystems. Increasing human populations lead to sources of light pollution, altering wildlife behavior and affecting their feeding, migratory, and reproductive cycles. Increasing sound levels from outside and inside the parks can have similar effects on wildlife. Excessive noise levels also negatively affect visitor experiences. Increasing numbers of people often augment the number of feral animals in the region, putting pressure on park wildlife and vegetation (NPCA 1977). Increasing vehicle traffic in and around the parks also leads to increased road mortality and the introduction of non-native species.

Land Use Change/Development

Development can include construction of roads, buildings, parking lots, wetland conversion, or conversion of adjacent agricultural land from grazing to vineyards. Certain species require open space for all or part of their habitat requirements while habitats of other species require vegetation cover. Land use changes or development can result in loss or reduced quality of wildlife habitat as well as its fragmentation. Habitat fragmentation can be a significant problem for wildlife and encompasses many of the other issues threatening park lands. It has cascading effects on habitat quality, quantity, and distribution of habitat, predator and prey densities and distribution, nutrient levels, pollutant loads, and disease and pathogen incidence and distribution. Fragmentation can also create barriers preventing the normal distribution or dispersal of species, isolating them in islands of parklands. Parks may become sources or sinks for populations and thereby increase complexity of species management.

Resource Extraction

Resource extraction results from dredging, sand mining, timber harvesting, harvesting of animals and herbaceous plants, recreational and commercial fishing, aquaculture, and withdrawal of limited water resources. Dredge soil disposal, contamination, erosion, siltation, species loss, alteration of habitat, reduced water quality and quantity, and impacts from construction and access can become significant management issues. Although these activities are generally not allowed on park lands, their effects can nonetheless be spread across virtually all ecosystems in the SFAN, including marine, terrestrial, and freshwater ecosystems. Mineral and soil extraction can increase sedimentation of downstream water bodies or increase pollutant concentrations associated with extractive byproducts. Extracting water, river rock, sand, and gravel can alter habitat by changing flow volume and patterns, reducing bank stability and changing sediment deposition patterns. Water table changes may also occur as a result of mining and well drilling, which can affect ground water-dependent habitats.

Soil Alteration

Soils are important to ecosystem integrity because they provide the primary media and components for most nutrient cycles while, in some cases, dictating the structure and functions associated with ecosystems on a given soil type. Soils can be altered by development activities, atmospheric deposition, climate change, altered precipitation patterns, water quality and quantity alteration, resource extraction, and changes in disturbance regimes. Erosion or sedimentation, soil compaction, changes in soil carbon and organic matter content, loss of soil biotic diversity, and altered soil chemistry can result from soil stressors. Although sediments are a natural part of most aquatic ecosystems, human activities have dramatically increased sediment inputs to lakes, streams, and wetlands. Soil compaction can limit water infiltration, percolation, and storage, affect plant growth, and alter nutrient cycling. Changes in soil carbon affect community productivity. Soil organisms, which are sensitive to changes in soil structure and chemistry, are essential to the formation and maintenance of soils as well as being key components in nutrient cycles. Significant alterations in soil biota will inevitably affect nutrient cycling and ecosystem functions.

Nutrient Enrichment

Nutrient enrichment, such as excess nitrogen and phosphorus concentrations, can affect marine, terrestrial, and aquatic ecosystems. Typically, nutrient enrichment results from excessive erosion, agricultural and commercial fertilizers, and runoff. Elevated concentrations of nitrogen and phosphorus can cause dramatic shifts in vegetation and macro invertebrate communities, paving the way for invasions of non-native species and reduced biodiversity. As an example, nitrogen-loading in shallow estuarine embayments can lead to shifts in the dominant primary producers—for example, macro algae may replace eelgrass—which can lead to declines in dissolved oxygen, altered benthic community structure, altered fish and decapods communities, and higher trophic responses.

Park Development and Operations

Increasing demographic pressures in the SFAN parks have caused increased park visitation. The rise in visitation puts greater demand on park resources and often requires changes in the park infrastructure and operations. Park roads may need to be resurfaced or extended. Parking lots may need to be expanded. Visitor and interpretive centers, campgrounds, and other facilities may need to be built or upgraded. Interpretive media may need to be maintained and sometimes relocated. On a broader scale, management activities such as installation of coastal barriers, fire suppression, grazing, invasive species control, removal of vegetation, and reclamation of nearshore areas can alter ecosystem structure and function. All of these activities impact the parks' natural resources and influence visitor use.

Recreational Use

Demographic changes can dramatically increase park visitation and recreational use, sometimes to unsustainable levels. This visitation pressure extends to trails and backcountry resources. The current broad variety of uses within the parks exacts a toll on the natural resources. Hang gliders, dogs, mountain bikes, horses, kayaking, environmental education groups, and hikers combine to put continued strain on wildlife, vegetation, water resources, and soils. The millions of visitors that frequent the SFAN parks each year have adverse effects on sensitive plants and wildlife. This high level of visitor use creates demands for continued park development or upgrading of existing development, particularly of trails, which fragment wildlife habitat, bring people into sensitive areas, and contribute to off-trail use in these sensitive areas.

Non-native Invasive Species/Disease

Non-native invasive species can reduce or eliminate native populations of flora and fauna, alter natural disturbance regimes, and change ecosystem functions. The sustainability of threatened and endangered species and the loss of more common species are of special concern. Non-native invasive plants, animals, diseases, and other pathogens also affect the structure and quality of habitat; alter species genetics and pollination dynamics; impact soil structure, biota, and chemistry; and can significantly affect watershed hydrology, including evapotranspiration rates, stream flow, and erosion and sedimentation dynamics.

Disease is known to occur in all plant and wildlife populations and can significantly affect local demographics. However, the level of impact on a species population varies and is largely unknown. Bacteria, fungi, parasites, and viruses contribute to plant and wildlife diseases. Many disease agents and vectors are naturally found in the environment, but their effect on species populations can be exacerbated by habitat fragmentation, overcrowding, and genetic isolation. Other diseases are introduced into populations by alien species and foreign sources that can have dramatic impacts on local populations.

Native Species Decline and Extirpation

Significant change in the diversity of native species is an important early warning sign of ecosystem distress. However, significant decline or loss of native species populations can also be a stress on a community or ecosystem in its own right. Maintenance of viable populations of native species is a fundamental part of maintaining ecological integrity. Declining native populations, then, can lead to impacts on ecosystem functions such as productivity, nutrient cycling, nutrient retention, energy transfer, habitat diversity and quality, terrestrial and aquatic linkages, and hydrologic function. A loss of functionality may be related to the decline or loss of a particular species. Loss of keystone species such as starfish, umbrella species such as elephant seals, or ecosystem engineers such as mountain beavers may be indicative of a shift in ecosystem type, resulting in cascading effects on other species.

Consultation and Coordination

Public Involvement to Date

Quite a bit of public involvement on dog walking in the GGNRA has already taken place, as described in the *Introduction* and *History of Dog Management* sections. Briefly, this involvement has included the following activities:

- The public's attendance of the Advisory Council meeting in early 2001, in which the voice control policy was declared null and void, and receipt of comments from the public attending that meeting.
- Comments from the public received within the 91-day comment period for the ANPR in January 2002.
- Public workshops to receive comments on the ANPR in March and April 2002.
- Random phone survey of 1,600 people in the four-county Bay Area in spring 2002.
- Interviews conducted as part of the negotiated rulemaking assessment process in 2004.

At the January 2005 internal scoping meeting, NPS staff discussed goals for future public involvement on this issue, along with means and processes that might be used to involve the interested and affected public more effectively. The following goals were derived from that discussion:

Goals of the Public Involvement Process

- Work toward community acceptance of the process *and* the solution.
- Allow community to participate to maximize creative thinking.
- Enhance public understanding of natural and cultural resource values, such as the ESA and legal obligations.
- Provide notice that the park is moving forward and now, not later, is the time for the public to help.
- Create broad/representative input at a local, regional, and national level.
- Education of members of the public on competing/similar interests of all involved groups or individuals.
- Enhance public appreciation of park resources and the challenges of park management.
- Promote understanding of the park's mandate and mission and of its connections to legislation, to the ESA, to the National Historic Preservation Act, and other elements.
- Public understanding that the NPS policies for national parks do not differ from those of national recreation areas.
- Formation of positive relationships with stakeholder groups.

- Opportunity to show public the science of park ecology.
- Demonstrate that park decision makers have an open mind.
- Prevent lawsuits.
- Clarify distinctions/differences among the GGNRA and local/regional parks and other local land management agencies.
- Show public criteria based on qualitative standards.
- Model quality civic engagement with this new way of public decision making.
- Keep staff, conservancy, and the rest of the park service updated.
- Keep elected officials informed.

Methods of involving the public

- Use surveys to ensure broad representation.
- Identify specific areas of concern.
- Conduct person-to-person outreach on the site.
- Use existing established newsletters for communication.
- Ensure consistent message within the park itself.
- Update park Web site.
- Provide for forums.
- Present different perspectives in news articles and radio broadcasts.

Additional groups to contact

Groups or representative individuals that may need to be contacted for input besides those contacted by the negotiated rulemaking mediators (see NPS 2004) are the following:

- MMWD and CA state parks.
- Neighboring agencies and local communities.
- Local environmental groups in Pacifica.
- Audubon groups in Marin and possibly San Mateo.
- Government agencies, particularly the National Marine Fisheries Service.
- San Mateo County Parks.
- Neighborhood associations.
- Bike coalitions.
- Marin County.
- US Attorney's Office.

- Various equestrian groups.
- The Presidio group.
- Trail clubs.
- Summer camps that use the park.
- Tourist Club.
- Mt. Tamalpais Hiking Club.

NEPA Public Involvement

The EIS process formally begins with a notice of intent (NOI) placed in the Federal Register, announcing the intention both to prepare an EIS and to begin public scoping. Public scoping can be performed via newsletters, electronic media, and so on but most often also includes an opportunity for verbal input from the public. The public is usually asked to submit comments within 30 to 60 days after the NOI publication. The public is sometimes kept up to date by way of a newsletter or information posted on the park's Web site. Because negotiated rulemaking has been selected by the park, the public will have additional opportunities for listening and providing input by attending meetings of the Negotiated Rulemaking Committee.

When the draft EIS is ready, it will be released to the public for their review. A notice of availability (NOA) is placed in the Federal Register. The public is allowed to review and comment on the draft for a minimum of 60 days after the appearance of the NOA.

After public comments have been collected, the NPS will respond to the most substantive public comments and produce a final EIS. A minimum of thirty days after notice that the final EIS is available (NOA), the GGNRA will issue the Record of Decision, selecting a particular alternative for implementation. Public notice of the decision is required.

Appendix A – Annotated Bibliography

Ackerman, Joshua T, John Y. Takekawa, Kammie L. Kruse, Dennis L. Orthmeyer, Julie L. Yee, Craig R. Ely, David H. Ward, Karen S. Bollinger, and Daniel M. Mulcahy.

2004 "Using Radiotelemetry to Monitor Cardiac Response of Free-Living Tule Greater White-Fronted Geese (*Anser albifrons elgasi*) to Human Disturbance". In *Wilson Bulletin*, 116(2), pp. 146-151.

The heart rates of free-living Tule Greater White-fronted Geese (*Anser albifrons elgasi*) were monitored during human disturbances on their wintering range in the Sacramento Valley in California during 1997. Implanted radio transmitters were used to record the heart rates of geese as an observer experimentally approached them at a constant walking speed. On average, geese flushed when observers were 47 m (range: 25–100 m) away. Change point regression was used to identify the point in time when heart rate abruptly increased prior to flushing and when heart rate began to level off in flight after flushing. Heart rates of geese increased as the observer approached them during five of six disturbance trials. On average, geese heart rates began to increase most rapidly 5 seconds prior to taking flight, and continued to increase rapidly for 4 seconds after flushing until reaching flight speed. Although geese heart rates increased as an observer approached, the largest physiological change occurred during a 9-second period (range: 1.0–15.7 sec.) immediately before and after flushing, when heart rates nearly tripled.

Alaska Department of Fish and Game

2000 Bibliography of effects of human trails and activity on birds and other wildlife, compiled by Rick Sinnott

Alexander, K.A. & Appel, M.J.G.

1994 "African wild dogs (*Lycaon pictus*) endangered by a canine distemper epizootic among domestic dogs near the Masai Mara National Reserve, Kenya." *Journal of Wildlife Diseases* 30(4):481-485.

The authors tested the prevalence of canine distemper virus among domestic dogs on lands adjacent to the reserve and found antibody prevalence levels rose from 1% in 1990 to 76% in 1991. Disease mortality rates also rose during this period. At the same time, tour bus drivers and researchers reported sightings of dead and dying wild dogs and a decline in jackal and bat-eared fox populations.

Bailey, T.N., Bangs, E. E. & Peterson, R. O.

1995 Exposure of wolves to canine parvovirus and distemper on the Kenai National Wildlife Refuge, Kenai Peninsula, Alaska, 1976-1988. In: Carbyn, L. N., Fritts, S. H. & Seip, D. R. (eds.) Ecology and Conservation of Wolves in a Changing World. Canadian Circumpolar Institute. 35:441-446

Bailey et al. (1995) live-captured wolves and coyotes to detect exposure to canine parvovirus (CPV) and canine distemper virus (CDV) in southern-central Alaska. The researchers found that an outbreak of CPV in domestic dogs, less than 1 km away from the refuge boundary was followed by an increase in CPV detection in wolves from 22% (1979-1981) to 67% (1986-1988). Radio-collared wolves were also observed near populated areas inhabited by dogs. The researchers note that as human development continues to encroach on the boundaries of the refuge, disease and parasite transmission from dogs to coyotes and wolves will increase.

Ballard, W. B., Whitlaw, H. A., Young, S. J., Jenkins, R. A. & Forbes, G . J.
1999 Predation and survival of white-tailed deer fawns in north central New Brunswick. *Journal of Wildlife Management*. 63(2):574-579

Ballard et al. (1999) identified the causes of mortality and survival rates of fifty neonatal, white-tailed deer (*Odocoileus virginianus*) in north central New Brunswick. Fawns were captured, fitted with a radio collar, and followed 2-3 times daily for 90 days and biweekly for 3 months. Cause of mortality was determined through site inspection, size and location of wounds, and direct evidence (Ballard et al. 1979, Mathew and Porter 1988). Of the 50 fawns captured, 44% died within the first year. Predation by coyotes (18%), black bears (10%), domestic dogs (6%), and bobcats (4%) was the largest cause of fawn mortality during the first 180 days of life. Domestic dog predation was the highest during the months of June through September.

Barkalow, F. S. & Keller, W. E.
1959 Escape behavior of the white-tailed deer. *Journal of Wildlife Management.* 14(2):246-247

The researchers witnessed a chase by three hunting hounds and a deer in a shrub bog habitat in North Carolina. The dogs trailed the deer for over an hour and a half for more than two miles. The non-spotted fawn was observed to be "nearing exhaustion", but later escaped by skulking in the water until the dogs were captured.

Bekoff, M. and C.A. Meaney
1997 "Interactions among dogs, people and the environment in Boulder, Colorado: A case study." *Anthrozoos* 10(1)

Behavioral data showed that off-leash dogs generally did not travel far off trail, that when they did it was for short periods of time, and that they rarely were observed to chase other dogs, disturb people, chase wildlife, destroy vegetation, or enter bodies of water. Off-leash dogs generally traveled less than 2-5m off trail for fewer than 1-2 minutes. Only 2 "earnest chases" of wildlife (1 deer, 1 squirrel) where the dog initiated and maintained the chase were observed. Also included summary of major issues- that dogs disturb other dogs, people, wildlife and the environment when off leash. Some data support this claim and other studies suggest dogs have a minimal demonstrable effect on wildlife or that human impacts are equally or more invasive.

Blanco, J. C., Reig, S. & Cuesta, L.
1992 Distribution, status and conservation problems of the wolf *Canis lupus* in Spain. *Biological Conservation*. 60:73-80

Blanco et al. (1992) studied the status and distribution of the wolf (*Canis lupus*) through questionnaires received from gamekeepers in northwestern Spain. The gamekeepers were questioned about the presence of stray dogs, defined as those which breed in the wild, live in packs, prey on livestock, and are afraid of people. The researchers noted that wolves compete with stray dogs for resources, limiting the number of stray dogs in an area. Of the gamekeepers outside the wolves' range, 38% noted stray dog presence. Within the wolves' range, this percentage was reduced to 9.8%. Out of 600 wolf carcasses, none showed evidence of wolf-dog hybridization in the region.

Burger, Joanna.

1986 "The Effect of Human Activity on Shorebirds in Two Coastal Bays in Northeastern United States." *Environmental Conservation.* 13(2): 123-130.

People walking accounted for 43-50% of disturbances to beach shorebirds in New Jersey. Other disturbances, in descending order of abundance, were from fishermen, airplanes, dogs, clam-differs, off-road vehicles, boats, children and joggers. The number of disturbances was highest in summer months. 30% of the birds remained relatively undisturbed; another 22-44% flew away but returned to nearby land, and 25-48% flew away completely.

1995 "Beach Recreation and Nesting Birds," In *Wildlife and Recreationists, Coexistence through Management and Research*, edited by Richard L. Knight and Kevin J. Gutzwiller, 281-298. Washington, D.C.: Island Press.

Habitat loss from the presence of recreationists, either at nesting sites or at feeding sites when the tide is low, for example, can be a major factor in the decline of beach-nesting birds. Some species habituate to people; most show increased response when their young are hatching. Defending a nest leaves eggs or chicks open to heat stress, predation. Solitary nesting birds may be the most vulnerable (piping plover)- people step on eggs, chicks, scare parents from nests. Mitigation: fencing or signing colonies has helped; leash laws or exclusion of dogs—terns respond to dogs as predators; create nesting habitat where people don't go; solitary nesters need to use education, small fences around nests, signs, wardens, predator control, leash laws, beach closures.

Butler, Robert W.

n.d. "Effects of Disturbance by Humans and Domestic Dogs on Wildlife". Environment Canada, Canadian Wildlife Service, Delta, British Columbia

The importance of the Lower Fraser River Valley to wildlife is discussed. Species of conservation concern are identified (birds, mammals, amphibians), as well as the effects of disturbance on this wildlife. Disturbance can reduce time spent feeding; disrupt migration, breeding, and wildlife's regular routine; and whether an individual animal survives. Dogs and humans on beaches displace birds from feeding areas. Studies show that birds will abandon areas regularly disturbed and return once the disturbance has relaxed. Recommendations on how to minimize conflicts include: protect wildlife habitat adequately, locate dog areas away from important habitat, free run areas.

Cape Peninsula National Park & Friends of the Dog Walkers

2002 "Draft Environmental Management Programme for Walkers Accompanied by Dogs in the Cape Peninsula National Park." Available online at http://www.cpnp.co.za/downloads/cmpfordogsfinal.pdf. Accessed on 22 November, 2004.

National Park in South Africa surrounded by suburbia with a large population has exceptional global biodiversity but is managed for enjoyment of local citizens without compromising ecological integrity. All people walking dogs need to have a "Go Green Card" that indicates dog walking is approved. To get it approved, need to have a signed code of conduct that is kept on file by the park. Those without cards are fined and asked to leave the park.

1995 Translocations of coyote rabies-Florida, 1994. *Morbidity and Mortality Weekly Report*. 44(31):580-581,587.

The Center for Disease Control reported a case of rabies infection of domestic dogs in Florida. These dogs were infected through coyotes (*Canis latrans*) from south Texas that were translocated to Florida.

Centers for Disease Control
1997 "Dog-Bite-Related Fatalities—United States 1995-1996."

From 1979 to 1994, attacks by dogs resulted in 279 deaths of humans in the U.S. Of 23 deaths where enough information for classification, 7 involved unrestrained dog or dogs off an owner's property, 5 involved restrained dogs on the owner's property and 11 involved unrestrained dog(s) on the owners property.

1995 "Beach Recreation and Nesting Birds," In *Wildlife and Recreationists, Coexistence through Management and Research*, edited by Richard L. Knight and Kevin J. Gutzwiller, 281-298. Washington, D.C.: Island Press.

Habitat loss from the presence of recreationists, either at nesting sites or at feeding sites when the tide is low, for example, can be a major factor in the decline of beach-nesting birds. Some species habituate to people; most show increased response when their young are hatching. Defending a nest leaves eggs or chicks open to heat stress, predation. Solitary nesting birds may be the most vulnerable (piping plover)- people step on eggs, chicks, scare parents from nests. Mitigation: fencing or signing colonies has helped; leash laws or exclusion of dogs—terns respond to dogs as predators; create nesting habitat where people don't go; solitary nesters need to use education, small fences around nests, signs, wardens, predator control, leash laws, beach closures.
Centers for Disease Control

2000 "Mass Die-off of Caspian Seals Caused by Canine Distemper Virus," abstract.

More than 10,000 Caspian seals, which live only in the Caspian Sea and are a vulnerable species, died in the spring of 2000 from canine distemper.

Chester, Tom.
2001 "The Effect of Dogs on Wildlife." Available online at http://tchester.org/srp/lists/dogs.html. Accessed on 1 November, 2004.

Dogs occasionally directly kill or injure wildlife, but usually are unsuccessful in the chase. Off trail they trample vegetation and can remove it by scratching or digging. Chasing birds can cause them to expend enough energy that they are malnourished or vulnerable to predators. Dogs can also transmit diseases- parvovirus and wolves in Glacier; muscle cysts and ungulates parasites, etc. in feces. Competition for water, feces adds nitrogen to the soils and encourages non-native plant growth; scent of dogs as a marker. Boulder – 1492 poop piles in one month despite ordinance to pick up after pets.

Chintimini Wildlife Rehabilitation Center
2001 "Pets and Wildlife," by Melissa Kilgore

About 15% of all animals admitted to the rehab center have been injured by cats and dogs. Cats especially kill birds, small animals. Loose dogs can form packs and chase and kill wildlife and livestock, or indirectly affect wildlife through energy loss.

City of Boulder, Colorado

2004 "Policies and Procedures for the Establishment of Fenced Dog Training and Exercise Areas (Dog Parks) and for the Establishment of Voice and Sight Control within Urban Park Areas." Available online at http://www.ci.boulder.co.us. Accessed on November 24, 2004.

Established two off-leash areas- 1) fenced dog training and exercise areas for people to train them to void control; no less than 1 acre and 2) voice and sight control areas- non fenced. Fenced areas are to be distributed in opposite ends of the city, not in environmentally sensitive areas, in locations not planned for other recreational development. Sight and voice control parks- linear parks with natural or man-made boundaries preferred.

2004 *Open Space and Mountain Parks Visitor Plan, April 2004*. Review Draft. Open Space and Mountain Parks Department. Available online at http://www.ci.boulder.co.us. Accessed on November 24, 2004.

City of Nashville and Davidson County

2003 "Metropolitan Board of Parks and Recreation: dog Management on Park Property Position Paper." Available online at http://www.nashvilledogparks.com/positionpaper.doc. Accessed online on 23 November, 2004.

Park rangers report that unrestrained dogs have become one of the most frequent sources of complaints on park property. Complaints include dog bites, dog fights, altercations between park visitors, negative impacts to the quality of visitor experience for runners, walkers, bikers. Established dog parks in regional parks, rather than neighborhoods, since neighborhood parks used by many different types of users. Install dog waste bag dispensers—estimate 31 million pounds of dog waste generated in Davidson County each year.

City and County of San Francisco Recreation and Park Department

n.d. "Exercising Your Dog in San Francisco Parks: A Guide for Your Dog's Best Friend." Dog Policy Brochure. Available online at http://sfgov.org/site/uploadedfiles/recpark/dog_policy_03012003a.pdf. Accessed on 2 November, 2004.

Identifies off-leash areas in SF, size and rules by color (green, orange, purple "bones"). Use soft barriers to identify off-leash areas.

City of Victoria Parks, Recreation and Community Development

2004 "Summary Report: Consultation on Dog Leash Optional Areas." Available online at www.city.victoria.bc.ca/cityhall/pdfs/currentprojects_prk**dog**_report.pdf. Accessed on 22 November, 2004.

Offered two options- one was to have leash-optional parks for a trial period; second was to have neighborhood dog owners "adopt" a space and be responsible for education, communication and site clean up. Document is summary of responses to options.

Cleaveland, S., Appel, M. G. J., Chalmers, W. S. K., Chillingworth, C. Kaare, M. & Dye, C.

2000 Serological and demographic evidence for domestic dogs as a source of canine distemper virus infection for Serengeti wildlife. *Veterinary Microbiology*. 72:217-227

Cleaveland et al (2000) investigated the role of domestic dogs and the epidemiology of canine distemper virus (CDV) in Serengeti lions (*Panthera leo*). After a four-year period, the researchers concluded that CDV persisted in high-density dog populations (1991-1994), but occurred only sporadically in lower-density populations (1991, 1994). By following the pattern of disease infection and studying serological data, it was determined that the higher-density dog population was most likely responsible for disease transmission through other mammalian vectors. i.e. mongoose, jackals, and hyenas. This disease epidemic resulted in a 30% mortality or disappearance of all known lions within a closely monitored study population.

Cleaveland, S. & Dye, C.

1995 Maintenance of a microparasite infecting several host species: rabies in the Serengeti. *Parasitology*. 111:S33-S47.

The researchers examined the relative role of wildlife and domestic animals in maintaining rabies in the Serengeti region of Tanzania. They concluded that dogs are the likely reservoirs of rabies because (1) dogs have been continuously infected with rabies since 1977, while (2) the cases of wildlife infection have been rare; (3) outbreaks in domestic dogs have preceded outbreaks in wild canids; (4) viruses isolated from wild carnivore populations have been indistinguishable from viruses isolated from domestic dogs; (5) dog rabies control programs between 1958-1977 eliminated the disease from dogs and wildlife. The researchers also noted that disease tended to persist in higher density, "agropastoralist" dog populations.

Colorado Division of Wildlife.

1975 Effects of Harassment on Wild Animals—An Annotated Bibliography of Selected References, written by P. H Neil, R.W. Hoffman, and R.B. Gill, Special Report #37.

1998 "Free-roaming Dogs Pose a Threat to Wildlife." *Wildlife Report: News from the Colorado Division of Wildlife."* Available online at Http://www.dnr.state.co.us/cdnr_news/wildlife/19986151228 2.html. Accessed on 15 November, 2004.

Growing problem of dogs chasing and killing wildlife as more residents, more subdivisions in mountains and existing residents increasingly disobeying leash and voice command laws. Dogs ten not to kill wildlife but chase it until it collapses in exhaustion. If they catch it, they mutilate, rather than kill it- bite off ears, nose, etc. of an animal. Attack fawns of deer and elk calves particularly. Also can flush or kill ground nesting birds, like mallards.

Columbia Animal Hospital website

2001 "Worms and Your Dog"

Intestinal parasites can be transmitted to dogs from larvae in poop, can also migrate to humans.

Coppinger, R. & Coppinger, L.

1995 Interactions between livestock guarding dogs and wolves. In: Second North American Symposium on Wolves: Edmonton, Alberta, Canada, August 25-27, 1992. Canadian Circumpolar Institute. University of Alberta, Edmonton, Alberta

The investigators studied how livestock-guarding dogs protected supplies of meat from wolves. Dogs were radio-collared and placed in fenced areas, baited with road-killed deer and farm scraps. Dog-wolf interactions were identified using tracks, direct behavioral observations, and radio-tracking individuals. Dogs were successful in protecting supplies of meat for limited periods of time because (1) wolves avoided areas occupied by dogs and (2) dogs interrupted wolf predation sequences through intraspecific, aggressive behaviors

Corbett, L. R. Marchinton, L. R. & Hill, E. C.

1971 Preliminary study of the effects of dogs on radio-equipped deer in a mountainous habitat. *Proceedings of the Southeastern Association of Game and Fish Commissioners*. 25:69-77

The researchers investigated the impact of dogs on the behavior, movement patterns, and mortality of deer populations in mountainous areas. Data were collected from radio-instrumented deer during managed coon hunts and experimental chases. During managed hunts, dogs had no effect on deer mortality based on observations of six radio-monitored deer. During experimental chases, eight radio-instrumented deer were subjected to twenty chases by hounds. Chases averaged 2.36 miles and lasted 54 minutes on average. Three deer mortalities occurred during the deer harassment, two attributed to dogs and one to bobcat. The researchers concluded that dogs have an increased impact on deer populations in mountainous areas compared to coastal plains on account of (1) predictable chase patters due to the terrain; (2) deer suffer more injuries when being chased through rugged terrain; (3) deer take more time to return to their home range in mountainous areas compared to coastal plains; and (4) in mountainous areas, dogs have a direct effect on mortality

Daily Nexus online

2003 "Award Recognizes Plover Protectors," by Delci Stranen. October 8, 2003

Found two plover eggs and fenced the area in spring 2001. One chick was fledged. By the following year, 14 chicks hatched. In 2002, 39 fledglings.

Delaware Natural Heritage Program, Division of Fish and Wildlife

1999 "The Effects of Recreation on Birds: A Literature Review." Prepared by Karen A. Bennett and E. Zuelke

Reviewed literature to summarize effects of recreationists on Cape Henlopen State Park, where a master plan for development and in particular a pedestrian/bike path is proposed. Overall, existing research clearly demonstrated that disturbance from recreation activities always has at least a temporary effect on behavior and movement of birds within a habitat or localized areas. Summary of some specific studies: general presence of dogs makes birds flush; unleashed dogs are a direct threat because they chase and can kill them, and because they make more rapid, erratic movements than leashed dogs.

Denney, R. N.

1974 The impact of uncontrolled dogs on wildlife and livestock. *Transactions of the North American Wildlife and Natural Resources Conference*. 39:357-291

Denney (1974) sent a two-page questionnaire to state and territorial departments of agriculture, wildlife conservation and natural resource agencies, and animal welfare and animal control agencies to determine the impacts of dogs on livestock and wildlife. The combined returns of the

state agricultural and state conservation agencies ranked damage to wildlife as the number one problem caused by unrestrained dogs.

Dog PAC of Santa Barbara, CA

2005 "Meeting the Need: Providing Off-Leash Recreational Space in Santa Barbara." Available online at http://www.dogpacsb.org/position2.html. Accessed on 2 November, 2004.

A two–part paper summarizing the need and benefits of providing off-leash dogs access to open space and the second a position paper on how much and where this PAC thinks the city should provide this space. Believes public demand, positive effects of exercise on dogs and on people, and the greater likelihood of compliance with city restrictions are the reasons it should be considered. Cites Santa Monica, Claremont, city of Los Angeles as having already dealt with the off-leash issue. Also Berkeley, Richmond, East Bay Regional Park District, Laguna Beach as having had off-leash policies with no claims of liability. Believes Santa Barbara should provide off-leash dog walking in proportion to the percentage of citizens with dogs—e.g. 32-50% of the city's parks should be open to off-leash dog exercise.

DogZones

n.d. "San Francisco's Officially Sanctioned DogZones"

Contains a list of areas within the City of San Francisco that allow dogs off leash if accompanied by their owners. Included is Golden Gate NRA, with specific areas listed by quadrant. A website link to areas in GGNRA and the Presidio related to dog walking is provided, along with a link to the park's "read on its 'process' regarding revisions to the once more liberal dog policies". The article notes that the need to provide temporary and permanent closures in some areas where sensitive species occur should not be confused with blanket prohibitions of off leash use of all areas of GGNRA.

Douglass, Kriss S., John Hamann, and Gayle Joslin.

1999 "Vegetation, Soils and Water." In *Effects of Recreation on Rocky Mountain Wildlife: A Review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of the Wildlife Society.* Available online at http://www.montanatws.org/PDF%20Files/9veg.pdf. Accessed on 16 December, 2004.

Summary of 520 references on various types of recreation, including dog walking (but also ORVs and many other types of uses). Has sections on general impacts of trampling to vegetation, spreading of weeds; erosion, compaction and rutting of soils; water quality and quantity issues related to roads, snowmobiles, backcountry use, personal watercraft. Not much on dogs, although a specific search found 33 articles, most on the impact of feral or hunting dogs on deer or livestock.

Durden, L. A. & Wilson N.

1990 Ectoparasitic and phoretic arthropods of Virginia opossums (*Didelphis virginiana*) in central Tennessee. *Journal of Parasitology.* 76(4):581-583

The researchers live-trapped 26 adult opossums in deciduous woodlands and systematically examined their fur for ectoparasites. The American dog tick, *Dermacentor variabilis*, was one of the dominant species with respect to mean intensity and prevalence levels (57%). This has led

scientists to refer to opossums as "carrier hosts" that can transfer parasites between domestic dogs and wildlife species

Dybala, Kristen
2002 "Golden Gate National Recreation Area Winter 2001-2002 Waterbird Survey Results." Marin Conservation Corps prepared for National Park Service.

Five surveys each on Rodeo Lake and Big Lagoon and 3 surveys on Tennessee Cover Pond for waterbirds during the winter of 2001-2002 were conducted. The three environments are different, as Big Lagoon is seasonally flooded and water depths are shallow, whereas the other two are permanent wetlands and are much deeper. Road construction near Big Lagoon also may have resulted in fewer birds observed than when it was quiet. Three species and 27 individuals were found at Big Lagoon: mallard, killdeer and bufflehead. Four species and 8 individuals at Rodeo Lake, including American coot, pied-billed grebe, great egret and American widgeon were observed. Three species and 8 individuals were also observed at Tennessee Cover Pond: American coot, bufflehead, and greater scaup.

East Bay Regional Parks District
n.d. "Study of Disturbance Factors' Impacts on Riparian Habitat and Stream Biota—Wildcat Creek and Redwood Creek, Contra Costa County"

Dogs in ponds and pools raised turbidity. Also found dogs upstream and raised turbidity downstream. Considered responsible along with human intrusion into Wildcat Creek for declining trout population. Implied by low numbers of young of the year rainbow trout in area of highest usage by humans and dogs. This also is the section of the creek with the most adequate "holdover" habitat and surface flow year round, so may be important fish habitat.

East Bay Regional Parks Fisheries Department
n.d. "Impacts of Disturbance on Habitat and Biota of East Bay Creeks"

Found no noticeable difference between the weight/length ratios of trout in impacted pools and trout in less impacted pools. Pools disturbance by dogs and visitors rarely exceed 5 minutes, but longer visits caused increased turbidity readings, as high as 104 NTUs. Dropped slowly; NTUs above 50 are known to affect trout feeding. Of 154 dogs observed, 66 pool or creek disturbances counted. The creek was actively disturbed only about 4.5% of the time, but was turbid 33.7% of the time. One pool had dog hair, was turbid, researchers believe dog use was correlated in this case to the poor health of the benthic macroinvertebrate community.

n.d. a "Impacts of Disturbance on the Biota and Water Quality of Redwood Creek"

Turbidity in this creek was highly affected by dogs but only slightly by people. After 15 minutes of dog activity at 3 sites, turbidity rose by between 50 and 300 NTUs. By the following day, turbidity had returned to original levels. Analysis of impacted v. non-impacted sites found lower number of trout (turbidity affects visual feeders like trout), 0.81 v. 1.03 respectively (? Units?). No significant difference in the number of trout or pollution sensitive insects.

Environmental Protection Agency
2001 "Managing Pet and Wildlife Waste to Prevent Contamination of Drinking Water" *Source Water Protection Practices Bulletin*

Short bulletin discussing sources of pet waste, management of it, diseases that may affect humans and available prevention measures.

Fehring, Katherine E., D. Stralberg, L.Y. Pomara, N.N Nur, D.B. Adams, D. Hatch, G. Geupel and S. Allan

n.d. "Modeling Landscape Characteristics of Northern Spotted Owl Nest Sites in Coastal California"

This study of the Northern Spotted Owl (NSO) focuses on Marin County CA where unique threats to the owl include proximity to urban development along open space boundaries, intense recreational pressures, habitat fragmentation, etc. Study objectives included: 1) identification of factors influencing NSO nest site selection, 2) the development of a spatial predictive model for NSO occurrence, and 3) the evaluation of the potential to use these modeling prediction for neighboring coastal counties and the comparison of the predictive ability of local GIS vegetation layers (vegetation photography) to regional satellite imaging. Results showed that habitation classification is a useful tool in predicting NSO distribution. However, it is also important to examine specific local conditions through the use of the best possible habitat mapping techniques to build models and develop predictive maps. In general, the probability of nest site occupancy was positively associated with the area of surrounding conifer and hardwood woodlands, but negatively associated with surrounding grassland, shrub and urban areas. Topographic conditions were the strongest predictors of nest locations. Low areas in watershed, close to streams were preferred, possibly related to predator avoidance, nest structure availability, etc. The NSO appears to be negatively affected by habitat fragmentation resulting from urbanization. Defining the varying habitat types allows land use planners and resource managers to better understand and protect the NSO and their habitat.

Feinstein, Arthur.

n.d. "GGNRA is Wrong Place for Unleashed Dogs: Park Service Must Protect Fragile Ecosystems." *Sierra Club Yodeler: The Newspaper of the San Francisco Bay Chapter.* Available online at http://sanfranciscobay.sierraclub.org/yodeler/html/2002/04/feature.htm. Accessed online on 1 November, 2004.

The guiding principal of land management should be to rein in activities that interfere with the primary values of these lands to provide sanctuary for wildlife and nature experiences for people. The National Park Service will be deciding whether to enter into a process that could lead to the legalizing of unleashed dogs in Golden Gate National Recreation Area (GGNRA). Over 400 studies reviewed indicate that human interactions with wildlife resulted in harm to wildlife. Dogs have not historically been a part of the ecosystem and can have adverse impacts on it. Discussion included on dog impacts to the federally listed western snowy plover. The Sierra Club seeks a win/win solution that does not deny the need for areas for unleashed dogs but believes these must not include the most sensitive and vulnerable habitat areas. These areas should not include national park lands which contain important cultural and natural resources.

Fernandez-Juricic, Esteban et al.

2004 "Spatial and temporal responses of forest birds to human approaches in a protected area and implications for two management strategies." *Biological Conservation.* 117; 407-416.

This is a scientific study addressing the effect of human disturbance on birds with discussion of what additional effect results from the presence of domestic dogs. Management of interactions

between human and forest-dwelling wildlife should include spatial and temporal considerations. One option would be designation of buffer zones based on minimum approaching areas. Re-distributing (not restricting) visitors based on spatial and temporal wildlife responses of differently sized species is another option. It is assumed that the intensity of wildlife response to humans increases with the number of visitors in a group and that the response to visitors depends on human visitation frequency, all of which is species-dependent.

Fernandez-Juricic, E. & Telleria, J.

2000 Effects of human disturbance on spatial and temporal feeding patterns of blackbird *Turdus merula* in urban parks in Madrid, Spain. *Bird Study*. 47(1):13-21

Fernandez-Juricic and Tellaria (2000) investigated how human presence affected feeding patterns of blackbirds in urban parks. The researchers used behavioral observation, noting vigilance behaviors, feeding rates, and spatial distribution of individuals at different levels of human disturbance. The researchers found that pedestrians were the main source of disturbance, in terms of flushing responses, followed by magpies (*Pica pical*) and dogs accompanying visitors. The effects of dog disturbance were not statistically analyzed due to a small sample size. The investigators propose management strategies such as restricting public use during the breeding season and curtailing the use of the park for dog walking in order to aid in the compromise between wildlife protection and visitor enjoyment.

Fitzpatrick, S. & Bouche, B.

1998 Effects of recreational disturbance on the foraging behavior of waders on a rocky beach. *Bird Study*. 56:157-171

Fitzpatrick et al. (1998) investigated the impacts of human recreational activities on the foraging behavior of three wader species, oystercatchers (*Haematopus ostralegus*), curlews (*Numenius arquata*), and redshanks (*Tringa tetanus*). The researchers recorded disturbance factors for 185 hours in various zones of beach use, namely grass, sand, upper shore, mid-shore, and low shore zones. Disturbance factors were defined as the activity of people and accompanying dogs (a) sitting-people/dogs stationary (b) walking-slow movement (c) fast activities-running, jogging, and bicycles. The researchers recorded the birds' reaction to disturbance by noting vigilance behaviors, feeding rates, and avoidance behaviors. Dog presence had no significant effect on the scan rate, pecking rate, or capture rate of foraging waders. The researchers noted that it was a surprise that the waders' vigilance did not increase significantly in response to dogs, especially because dogs exercising on the beach chased the waders on more than one occasion. The authors noted that habituation might play an important role in diminishing response to regular, but benign disturbances.

Fong, Darren, D. Collman, T. Elliott, E. Martin

2004 "Habitat Enhancement for the Endangered San Francisco Garter Snake," Construction Summary Report.

The project involved enhancement of foraging habitat for the San Francisco garter snake and California red-legged frog. The USFWS believes that the snake's use of the area is limited by availability of secure basking sites, foraging areas, and upland cover. This article addresses the recommendations and completion of management actions included in the Biological Opinion. These actions included the creation of shallow impoundments (foraging habitat), fencing to prevent human/dog encroachment, and establishment of cover. Several ponds were constructed

and construction fencing and signs were erected to protect snake habitat from dog disturbance. Hydrologic and snake monitoring continues.

Francis/King and Mill Hill Regional Parks

2004 "Dog Management in Thetis Lake, Francis/King and Mill Hill Regional Parks. Agreement of the Management Plan Advisory Group." Available online at www.citizencanine.org/crddoc/Options.doc. Accessed online on 23 November, 2004.

A list of agreements on how to manage dogs at these parks. Agreed that dogs are on leash in all parts of the parks except along powerlines, and along fire roads for a six month trial period. Also designated splash areas.

Fuller, T. K.

1990 Dynamics of a declining white- tailed deer population in north-central Minnesota. *Wildlife Monographs*. 110:1-37

Fuller (1990) investigated the survival, population change, and relative importance of mortality factors of white-tailed deer between 1981-1986. Predation by dogs accounted for 1% of the overall mortality and 2% of the winter fawn mortality. Dogs also accounted for at least 3% of all mortality for radio-collared deer greater than 6 months old. The impact of dogs on neonatal fawns was not determined.

Gardali, Thomas

2003a "Baseline Bird Surveys in Future Restoration Sites in the Presidio 2003." PRBO Conservation Science Report to the Presidio Trust.

The article outlines the eight restoration activities within the Presidio initiated by the Presidio Trust and NPS. The project's objective is to document avian diversity and abundance during the breeding season. Future management decision will be aided by this research. Surveys conducted in spring and summer counted and recorded bird species, along with detection type (song, call, visual). Breeding behavior was also recorded. Data forms, metadata, instructions, databases, and data entry and proofing programs can be found at http://www.prbo.org/tools/as/as.htm. Four survey sites are addressed in this article with tables of recorded species and their breeding behaviors noted, by site.

2003b "Point Count Monitoring at Crissy Field 2003." PRBO Conservation Science Report.

The article summarizes bird survey work conducted at Crissy Field in 2003. Methods, list counts of all species detected, and species detected within dune habitat are noted, along with comparisons to the 2002 surveys. A total of 34 species were noted with relatively few (8) noted as using restored dunes.

Gardali, Thomas, Sandra E. Scoggin and Geoffrey R. Geupel

1999 "Songbird Use of Redwood and Lagunitas Creeks: Management and Restoration Recommendations; Report to the GGNRA"

The nesting success of songbird species breeding in Redwood and Lagunitas Creeks in GGNRA was studied through nest monitoring, territorial mapping, and vegetation assessment. Fourteen

species were identified nesting within these two creeks but special attention was given to four (Swainson's Thrush, Warbling Vireo, Wilson's Warbler, and Song Sparrow). System-wide structural diversity and two tree species, red alder and California bay, were identified as important variables influencing nest success. Nesting substrate preferences are presented for five specific songbird species, as well as all species combined. Management and restoration recommendations are presented for resident and Neotropical migrant songbirds in the two riparian areas within GGNRA. Some of these include scheduling human activities around the non-breeding season, appropriate plantings, removal of non-native plants, protection/restoration of upland habitats, management of adjacent habitats, and education of private landowners.

Genovesi, P. and Dupre, E.

in press. Survey on the presence and management of free-ranging dogs in Italy. *Biologia e Conservazione della Fauna Selvatica.* I.N.F.S., Bologna

The investigators surveyed 3000 individuals in rural Italy to determine the impact of free-ranging dogs on wildlife, to census owned dogs in rural areas, and to estimate the proportion of time that dogs are unleashed. Genovesi and Dupre reported that dogs did cause the destruction of a large number of nests of colonial ground-nesting birds. The largest flamingo colony in Italy (Sarninia) was completely destroyed by 5 uncontrolled dogs in 1998 and the total destruction of water bird colonies was regularly reported in several lagoon complexes. The researchers also found that people seemed to have a misconception of the risks posed by dogs; 51% of Italians surveyed responded that dogs did not pose any problem as a sanitary, social, or conservation risk.

Gill, M.

1994 Bird flushing by dogs at proposed Eastshore State Park: can they all just get along? In: Contemporary Topics in Environmental Sciences. Sloan, D., Edlunds, E., Christensen, M. & Taylor, K. (eds.) University of California, Berkeley.

Gill (1994) researched the incidence of bird flushing in response to dog and human activity in the mudflats north of Point Isabel Regional Shoreline, San Francisco Bay Area. At the time of the study, dogs were allowed off-lease along the shoreline and trails. Out of 19 hours of behavioral observation, the researcher witnessed 9 flushings which involved approximately 16 birds. Three of the flushings were unintentionally caused by the researcher. Five of the flushings were caused by dog activity, and one flushing was human-induced. The researcher indicates that dogs do cause flushing of birds in the mudflat area; however he suggests that more research is needed to determine whether or not these flushings are detrimental to the individual birds and the species populations. Gill recommends a minimal requirement of leashing dogs in the east bay parks.

Gipson, P. S. & Sealander, J. A.

1975 Ecological relationships of white-tailed deer and dogs in Arkansas. In:Phillips, R. L. & Jonkel, C. (eds.) *Proceedings of Predator Symposium, Montana Forest and Conservation Experiment Station*, University of Montana, Missoula. pp. 3-16

The researchers noted the direct and indirect effects of repeated harassment by dogs on radio-collared deer by using experimental chases. Dogs pursued deer and average of 40-52 minutes for and average of 1.6-1.9 miles. All harassed deer left their home ranges at least one time, returning within 72 hours in all cases. During 61 experimental changes, one case of mortality occurred that might have been related to dog harassment. The investigators argued that dogs were ineffective predators of white-tailed deer, compared with natural predators such as wolves, coyotes, and mountain lions.

GoodPooch.com

n.d. "Leash Laws Cause Dog Bites." Available online at http://www.goodpooch.com/MediaBriefs/leashlawscausebites.htm. Accessed on 2 November, 2004.

The article is a discussion of the reasons why leash laws do not solve the problem of dog bites/aggressive dogs. It includes the history of leash laws, responsible versus irresponsible dog owners, and the need for dogs to socialize. The common elements of a dog-biting incident are discussed. Because of the interference with the normal socialization process, leash laws are responsible for causing restriction-related behavior problems such as aggression.

Gottelli, D., Sillero-Zubiri, C., Applebaum, G. D., Roy, M. S., Girman D. J., Garcia-Moreno, J., Ostranders, E. A. & Wayne, R. K.

1994 Molecular genetics of the most endangered canid: the Ethiopian wolf, *Canis simensis*. Molecular Ecology. 3:301-312.

Gottelli et al. (1994) examined blood samples from 54 Ethiopian wolves and 40 domestic dogs to compare mitochondrial and microsatellite DNA variation from the two populations. The mitochondrial DNA analysis found that hybridization between female domestic dogs and male Ethiopian wolves is rare or absent. However, the microsatellite variation analysis determined that hybridization does occasionally occur between male domestic dogs and female Ethiopian wolves. These individuals are phenotypically unique and represent about 17% of the sampled population. The researchers conclude that hybridization does threaten the genetic integrity of the Ethiopian wolf.

Greater Vancouver Regional District

2000 "Canine Conundrum in GVRD Parks; Research, Issues, Possible Solutions." Symposium Guide

Discussion of a dog's health and its relationship between humans and other dogs as they mature. Environmental impacts from dogs include those to vegetation, wildlife (birds, small mammals, aquatic systems), and soils (compaction, erosion) are discussed, along with public health (feces and urine) issues.

Guberti, V. Stancampiano, L. & Francisci, F.

1993 Intestinal helminth parasite community in wolves (*Canis lupus*) in Italy. *Parassitologia*. 35:59-65

Guberti et al. (1993) studied the species composition and evolutionary origin of intestinal parasites in 89 wolves. 12 identified parasites were coded as dominant, codominant, and subordinate, according to their frequency of occurrence. Dominant parasites were commonly found in wolves or wolf prey species, while codominant and subordinate parasites were more common to foxes, domestic dogs, and other non-prey species. These results suggest that wolf receptivity to parasite species is overlapping but partially distinct from dogs' and foxes.

Gustaitis, Rasa

1998 "Is there a place for dogs in urban parks and on beaches? Dog days in the City." *California Coast and Ocean*

A summary of attempts by some California coastal community dog-walkers to unite and get open space set aside for them to walk dogs off leash. Describes San Francisco Ocean Beach/western

snowy plover conflict and argument by at least one dog-walker that the park has "not firm scientific basis" for closing 2.2 miles to dogs off leash.

Hamerstrom, F., Berger D. D. & Hamerstrom, F. N.
1965 The effect of mammals on prairie chickens on booming grounds. Journal of Wildlife Management. 29(3):536-542.

Hamerstrom et al. (1965) spent over 4700 mornings in a blind, observing the courtship displays of greater prairie chickens (*Tympanuchus cupido pinnatus*) on booming grounds. After 21 spring seasons, a total of 179 incidents involving mammals were observed. Of 25 domestic dog visits, 13 caused total flushes of prairie chickens from their booming grounds. This is a higher proportion than the flush response caused by native mammals such as coyotes, ungulates, red foxes, and badgers. The only prairie chicken mortality during the observation periods was caused by a domestic dog.

Hatch, Daphne
1996 "Western Snowy Plover (a Federally Threatened Species) Wintering Population and Interaction with Human Activity on Ocean Beach, San Francisco, GGNRA 1998 through 1996."

The study involves 15 to 85 non-breeding plovers which frequent Ocean Beach (GGNRA) for up to 10 mos./year where they are subjected to intense recreational pressure. Monitoring was established in 1994 to determine numbers/distribution of plovers, people and dogs, current levels of disturbance to plovers, and changes in disturbance following implementation of snowy plover protection measures (including leash restrictions). Of 5,692 dogs counted during surveys, only ten percent were leashed, 50 percent were roaming with potential to disturb birds and six percent were observed chasing birds. Nineteen dogs were observed chasing at least 62 snowy plovers in approximately 40 hours of observations. Roaming dogs disturbed at least another 100 plovers. Plovers take flight more readily and expend more energy when approached by dogs than by people on foot. Plovers were also unintentionally disturbed by other recreational beach area uses (bicycles, vehicles, kit-flying, etc.). These disturbances will be addressed in a snowy plover management plan underdevelopment for Ocean Beach. Control of unleashed pets in areas frequented by snowy plovers will increase their protection and provide benefits to migratory shorebirds that depend on the sandy beach habit of Ocean Beach for feeding and resting.

Hellwig, Christian
2004 "Monitoring the Western Snowy Plover Wintering Population on Ocean Beach 2000-2001. Golden Gate NRA."

The current monitoring season began in July 2000. Formal surveys were conducted on 35 days. On every survey date with the exception of one, at least one snowy plover was seen on Ocean Beach. The maximum number of birds observed on any given day was 23. The average number of birds seen per census day was 12.14; the median was 13. Plovers were engaged in various activities (feeding, resting, hiding) when spotted. Observations made included those of human activities, especially those of human and dogs. Weekend days were notable for the high numbers of people and dogs on the beach. The maximum number of dogs counted on the beach on a given day was 60, coinciding with the analogous date for maximum humans. The average number of dogs counted was 26; the median was 25. Dog numbers are broken down by sectors of study, reflecting the more popular beach areas for dog walking. A larger percentage of dogs are leashed in sectors where plovers are present than in those sectors where they are absent. Compliance with leash laws by sector is presented. Overall, 78% of dogs on the beach are not restrained by leashes;

four percent were seen chasing birds (none of which were plovers). Outreach to dog owners should have increased attention. There seems to be little correlation between the number of plovers potted on the beach versus number of humans and dogs. *Note*: figures referred to in the document missing.

Hockin, D.

1992 "Examination of the Effects of Disturbance on Birds with Reference to its Importance in Ecological Assessments." *Journal of Environmental Management.* 36: 253-286.

The article addresses the role of land use change/development in conservation of species and habitats, acknowledging that these issues cause wildlife disturbance. While studies as to how species respond to disturbance has been fragmented, it is an important consideration in impact assessment. This paper reviews what is known about disturbance factors related to birds. Appendices summarize the literature on disturbance effects on breeding, breeding success, nest-site choice, population density, community structure, and distribution and habitat use. Human-induced disturbances (public access [pedestrian and vehicular], water-based recreation, shooting, industrial development) which negatively affect breeding success and the use of sites by birds is presented. These disturbances can collectively result in, among other things, the need for compensatory feeding at night by some species, breeding disruption, habitat loss, and artificial light impacts. A number of mitigation strategies designed to reduce disturbance or to attempt to compensate for habitat loss are discussed and presented in Table 1. *Note*: Appendices referenced in the article are not appended.

Huegel, C. N., Dahlgren, R. B. & Gladfelter, H. L.

1985 Mortality of white-tailed deer fawns in south-central Iowa. *Journal of Wildlife Management.* 49(2):377-380

The researchers investigated the cause of mortality and survival rate of 55 radio-collared fawns until the age of 180 days. Fawn deaths were attributed to dogs when dog tracks were identified at the kill site, carcasses were mauled but remained intact, and head and neck wounds were lacking. Coyotes caused 53.8% and dogs caused 23.1% of the 13 fawns deaths recorded. Predator-induced deaths occurred during all 30-day periods to 150 days, and rate of predation was relatively constant among periods. No fawns were killed between 151-180 days old.

Hunt, G. R., Hay, R. & Veltman, C. J.

1996 Multiple kagu *Rhynochetos jubatus* deaths caused by dog attacks at a high-altitude study site on Pic Ningua, New Caledonia. *Bird Conservation International.* 6:295-306

Hunt et al. (1996) reported the effects of dogs on the decline of the threatened kagu (*Rhynochetes jubatus*), a ground-nesting, forest-dwelling bird in New Caledonia. The kagu deaths were discovered accidentally while carrying out a behavioral study on birds. The researchers found 15 dead and 5 wounded kagus over a 14-week period (four of the five wounded kagus later four of which were found by chance. Evidence of dog predation included (1) eleven dog observations (barking of visual) were recorded in the study area, (2) kagu remains were found in all dog scats collected, (3) kagus' wounds were consistent with dog bites, and (4) one dog killed at the study site had kagu remains in its stomach. The researchers conclude that dogs are dangerous predators of kagus and efforts need to be made to protect there birds from dog predation

Jensen, Heather, D.B. Adams, W. Merkle and K. Fehring

2004 "Northern Spotted Owls in Marin County, California." Annual in-house report (Not for public distribution)

The report describes results of the eighth demographic study of Northern Spotted Owls in Marin County CA which represents the southern limit of the sub-species' range. A total of 46 Spotted Owl territories were designated as long-term monitoring sites, with a subset of 30 randomly selected sites used to determine reproductive status. The remaining 16 were confirmed at minimum as to occupancy status. Pair occupancy was confirmed at 40 of the 46 long-term monitoring sites. At the 30 sites monitored for reproductive status, a total of 16 females (53%) attempted nesting. Twelve successfully nested and yielded a total of 21 young. Fecundity for 2004 was 0.44 (±0.097), average for the county over the last five years. In fact, average fecundity for 1997-2004 of 0.45 (±0.076)is higher than the long-term average fecundity of 0.34 (±0.010)over the owl's range as reported for 1985-1993, though this may be a product of different protocols. One hundred seventy nests have been located over the past eight years. Twenty four nests were located in 2004 (24 new, three reused). Discussion of nesting habitat/nest structures is included. Banding efforts of the study were terminated in 2004. Of the 110 owls banded before 2004, 37 were resighted in 2004, some of which were observed in new locations. Current threats to this Spotted Owl population include disturbance by park visitors and birding enthusiasts, development along wildland/urban interfaces, impacts of Sudden Oak Death, continued Barred Owl detections, and recent positive confirmation of West Nile Virus in Marin County.

Jones and Stokes

1977 "Dog Depredation on Wildlife and Livestock in California." Prepared for the California Department of Fish and Game

Used questionnaires to evaluate the uncontrolled dog problem and determine what measures could be taken to protect wildlife and livestock. Researchers found that dog-wildlife interactions typically occurred in areas used extensively by both humans and wildlife. Feral dog disturbances constitute only a fraction of losses to wildlife, whereas domestic dogs cause the majority of depredation. Dog depredation can have serious effects on local deer herds and concentrated nesting bird populations.

Kat, P. W., Alexander, K. A., Smith, J. S. & Munson, L.

1995 Rabies and African wild dogs in Kenya. *Proceedings of the Royal Society of London Series.* 262:229-233

Kat et al. (1995) investigated the cause of death of more than 90% of the individuals in one pack of African wild dogs (*Lycaon pictus*). Histological examinations of brain tissue revealed an infection of rabies viral encephalitis, a variant common among domestic dogs in Kenya and Tanzania. Through behavioral observation and radio-tracking, the researchers found that the wild dogs ranged over an area of 650 km², which was inhabited by 750 domestic dogs. The investigators documented considerable contact between domestic and wild canids between 1988 and 1990.

Keller, V. E.

1991 Effects of human disturbance on eider ducklings *Somateria mollissima* in an estuarine habitat in Scotland. *Biological Conservation.* 58:213-228

Keller (1991) investigated the frequency of human activities and assessed their effects on eider creches in an estuarine habitat. Human activities were divided into shore-based and water-based activities. Shore-based activities, which included fisherman, people walking on shore dogs, and

cars caused the most disturbances, while water-based activities, which included surfers and boats, caused relatively little disturbance. 70% of the disturbances were caused by dogs and people accompanied by dogs, while people without dogs accounted for only 9% of the disturbances. People and dogs also caused more disturbances than expected from their frequency of occurrence. When approached by dogs, creches in the water clustered together and remained more than five meters off shore for a significantly longer period of time than when they were disturbed by people alone. Creches on the shore flew twice as far when disturbed by people accompanied by dogs, compared to people alone. As a result, disturbed creches experienced five times more predator encounters, a reduction in feeding time, and an increase in energy expenditure.

Kirby, J. S., Clee, C. & Seager, V.
1993 Impact and extent of recreational disturbance to wader roosts on the Dee estuary some preliminary results. *Wader Study Group Bulletin*. 68:53-58

Kirby et al. (1993) used volunteer wardens to record disturbances of birds at an estuary from 1986 to 1991. Observers recorded the number of potential disturbing agents, the actual disturbances observer, and the number and behavior of wader species. Dogs accounted for 26-41% of the total number of potential disturbing agents in all years. Dogs (27-72% of the total) and walkers (20-34% of the total) were responsible for the majority of the disturbances recorded in all years. Although the potential for disturbance increased during the period of this study, the amount of disturbance remained the same, and the majority of bird species increased in number. The researchers point to the possibility that a successful program of education and intervention by voluntary wardens may mitigate an increase in recreational use.

Knight, Richard L. and D. Cole
1995 "Wildlife Responses to Recreationists," chapter 4 in *Wildlife and Recreationists, Coexistence through Management and Research*, edited by Knight and Gutzwiller, Island Press 1995.

Summary of the types of impacts recreationists can have on wildlife, including through exploitation, disturbance, habitat modification and pollution. Even nature viewing can be disruptive and cause birds to take flight. Humans visiting bird nests can leave a scent that predators later follow to find the nest. Small section on dogs—that they cause a greater increase in heart rates of bighorn sheep than humans alone; prairie chickens showed stronger response to dogs than native predators. Water based recreation can deprive animals of roosting or feeding habitats- swimming, boating, etc. This is a chapter in a book that is devoted to this subject, including a chapter on impacts on shorebirds of recreationists.

Lafferty, Kevin D.
1999 "Status, Trends, and Conservation of the Western Snowy Plover with a Focus on the Devereux Slough Population at Coal Oil Point Reserve, Santa Barbara County, CA." Museum of Systematics and Ecology Environmental Report No. 15, University of California, Santa Barbara.

Increased habitat destruction, predation, beach access and recreation has led to a region-wide decline in the western snowy plovers abundance and in the number of sites where they breed and over-winter. The Coal Oil Point Reserve has been designated by the USFWS as Critical Habitat for snowy plover. Within this area, birds roost near the mouth of the Devereux Slough and forage along the beach. Up to 167 individuals winter at this site, representing about 10% of the entire western snowy plover US population. Predation, beach erosion, encroachment of exotic vegetation, and disturbance from recreation all pose threats of increasing magnitude to the snowy

plovers. Human activities (approaching birds too closely, walking pets, kite flying, fires, boat landings, etc.) disturbed the birds more than twice as often as all other natural causes combined. In depth discussion related to impacts of dogs chasing birds is included. Management approaches include reducing predation, non-native vegetation, human disturbance (including pets) erosion control structures that alter beach topography, as well as addressing contamination such as oil spills.

2001a "Disturbance to Wintering Western Snowy Plovers." *Biological Conservation.* 101(2001):315-325.

Report of observations of snowy plovers, a Federally threatened species, and activities that might disturb them at a beach near Devereux Slough in Santa Barbara CA. Such disturbance was 16 times higher at a public beach than at protected beaches. Wintering plovers reacted to disturbance at half the distance (40 m) as has been reported for breeding snowy plovers (80m). Humans, dogs, crows and other birds were the main source of disturbance on the public beach. Each snowy plover was disturbed an average of once every 27 weekend minutes and once every 43 weekday minutes. Dogs off leash represent a disproportionate source of disturbance. Plovers were more likely to fly from dogs, horses and crows than from humans and other shorebirds. Plovers were less abundant near trailheads. Over the short-term, plovers did not acclimate to or successfully find refuge from disturbance. Feeding rates declined with increased human activity. A model was created from this data that predicted rates of disturbance given various management actions. The model found that prohibiting dogs and instituting a 30m buffer zone surround a 400m stretch of beach provided the most protection for plovers for the least amount of impact to beach recreation. Voluntary compliance with posted leash regulations is very low. Managing for snowy plovers could inadvertently increase disturbance to other shorebirds by increasing pet density in areas immediately outside the managed area (edge effect). In addition, requiring people to walk along the wet sand to avoid plovers concentrates activity into precisely the locations where disturbances to most other bird species occur.

2001b "Birds at a Southern California Beach: Seasonality, Habitat Use and Disturbance by Human Activity," *Biodiversity and Conservation* 10: 1949-1962.

Research objectives of the study were to determine 1) factors associated with bird and human use of the study site and 2) how disturbance varied with bird species, human activity and the distance between the two. Use of Santa Barbara beaches by humans and birds varies in both time and space. Bird density varied with the season and tide, with distributions along the beach determined mainly by habitat type. Human activity varied most between weekend and weekday with a significant increase on the weekends resulting in twice the numbers of dogs when compared to weekdays. For crows and western gulls, there is evidence that access to urban refuse increased abundance. Interactions between birds and people often caused birds to move/fly away, particularly when people were within 20m. During a short observation period, 10% of humans and 39% of dogs disturbed birds. More than 70% of birds flew when disturbed. Snowy plovers, 25% of the birds observed, reacted to disturbance by dogs at twice the distance that they do to pedestrians. Pet activity reduces shorebird abundance and those birds that remain spend more energy on vigilance and escape at the expense of foraging/rest. Bird species varied in the frequency that they were disturbed, partially because a few bird species foraged on the upper beach where contract with people was less frequent. Most disturbances occurred low on the beach. Although disturbances caused birds to move away from humans, most displacement was short enough that variation in human activity did not alter large-scale patterns of beach use by the birds. Birds were less reactive to humans (but not dogs) when beach activity was low.

Laurenson, K., Sillero-Zubiri, C., Thompson, H., Shiferaw, F., Thirgood, S. & Malcom, J.
1998 Disease as a threat to endangered species: Ethiopian wolves, domestic dogs and canine pathogens. *Animal Conservation*. 1:273-280

The investigators looked at the effects of three canine diseases (canine distemper virus, canine adenovirus, and canine parvovirus) on domestic dogs and Ethiopian wolves (*Canis simensis*) in Bale Mountains National Park, Ethiopia. They found evidence of rabies, CDV, CAV, and CPV infections in sympatric domestic dogs and wolves. Anecdotal and serological evidence showed that rabies infected the domestic park dogs in 1992-1993. This was most likely contracted from a higher density, urban dog population nearby where this virus appeared to be highly seroprevalent and endemic. Ethiopian wolves suffered a dramatic population decline from exposure to rabies between 1990-1992. Although the population decline continued until 1995, the researchers could not assess whether the concurrent park dog infection also affected wolves.

Lord, A., Waas, J. R., Innes, J. & Whittingham, M. J.
2001 Effects of human approaches to nests of northern New Zealand dotterels. *Biological Conservation*. 98:223-240.

Lord et al. (2001) tested the effects of human disturbance on the northern New Zealand dotterel (*Charadrius obscurus aquilonius*), an endemic, endangered shorebird. The following types of approaches were made towards an incubating bird at a nest: (1) a person walking, (2) a person running, and (3) a person walking with a leashed and muzzled dog. The researchers recorded flush distance (the distance between the investigator and the incubating bird when it left the nest), length of time spent off the nest, intensity of distraction displays, and evidence of habituation to nest disturbance. They found that birds flushed from their nests earlier and stayed off their nests for longer periods of time when approached by a person leading a dog, compared to a person running or walking.

Lorenzini, R. & Fico, R.
1995 A genetic investigation of enzyme polymorphisms shared by wolf and dog: suggestions for conservation of the wolf in Italy. *Acta Theriologica*. 3:101-110

The researchers used electrophoretic variation testing to determine the extent of genetic difference between wolf and domestic dog populations. The differences in allelic frequencies at loci polymorphic in dogs and wolves did not suggest substantial wolf-dog interbreeding

Lowry, D. A. & McArthur, K. L.
1978 Domestic dogs as predators on deer. *Wildlife Society Bulletin*. 6(1):38-39.

The authors published the reports made by one Idaho Fish and Game Department conservation officer in 1975 in the Coeur d'Alene River drainage of northern Idaho. 39 incidents involving dog-deer interactions were either directly witnessed by the officer or reported to the officer by concerned citizens and the sheriff's department. 12 of the 39 incidents resulted in the direct mortality of white-tailed and mule deer. Deer were caught and killed, drowned after being chased into the river, or shot after they were crippled. Most of the observed chases occurred in the winter, and most of the kills were in the late winter. The researchers noted that these results were in contrast to the findings of other researchers (see Progulske & Baskett 1958, Corbett et al. 1971, Sweeney et al. 1971, Gavitt et al. 1974, Olson 1974), because this study involved the presence of free-roaming pets and feral dogs instead of trained, hunting dogs.

MacArthur, R. A., Geist, V. & Johnston, R. H.
1982 Cardiac and behavioral responses of mountain sheep to human disturbance. *Journal of Wildlife Management*. 46(2):351-358.

MacArthur et al. (1982) observed the behavioral and physiological responses (heart rate) of eight mountain sheep to various human disturbances, i.e. road traffic, aircraft, people, and dogs. Standardized harassment trials were conducted where sheep were disturbed by a human with or without a leashed dog to within 50 meters. Mountain sheep showed a lower reactivity to human disturbance, compared to human/dog disturbance. The mean maximum rise in sheep heart rate, the overall mean elevation rise in heart rate during a three minute approach period, and mean withdrawal or flee distances were all greater in human/dog approaches than in human approaches. The researchers also noted that physiological responses to stress lasted longer than behavioral, "alarm posture" responses.

MacArthur, R. A., Johnston, R. H. & Geist, V.
1979 Factors influencing heart rate in free-ranging bighorn sheep: a physiological approach to the study of wildlife harassment. *Canadian Journal of Zoology*. 57:2010-2021.

The researchers investigated the factors influencing the heart rate of female bighorn sheep. Heart rate was recorded during normal social interactions, disturbances, and harassment trials during which humans approached to within 20-50 meters with or without a dog. The appearance of free-ranging canids evoked maximal increases in heart rate and withdrawal responses. Ewe heart rate also increased when approached by a human with a dog, compared to a human without a dog. However, heart rate was significantly greater when reacting to a free-ranging dog, compared to a human with a dog. This suggest that bighorn sheep can habituate to some human activities.

Mainini, B., Neuhaus, P. & Ingold, P.
1993 Behavioral of marmots *Marmota marmota* under the influence of different hiking activities. *Biological Conservation*. 64:161-164.

Mainini et al. (1993) investigated the behavior of marmots in reaction to various hiking activities. Five types of activities were investigated: (1) trail hiking, (2) cross-country hiking, (3) hiking off trail and around marmot burrows, (4) trail hikers with a dog on leash and (5) cross-country hikers with a dog on a 10 meter leash simulating a free running dog. The researchers found that free-running dogs and dogs on a leash had the severest impact on marmot burrowing behavior followed by cross-country hikers and trail hikers. Marmots were found to retreat more often and stay in their burrows longer when confronted by free running or leashed dogs as compared to cross-country or trail hikers. To conserve marmot populations, the researchers recommend that hikers remain on established trails and that dogs are banned from highly frequented trails and burrow areas.

Meek, P. D.
1999 The movement, roaming behavior and home range of free-roaming domestic dogs, *Canis lupus familiaris*, in coastal New South Wales. *Wildlife Research*. 26:847-855.

Meek (1999) investigated the wandering behavior of 10 radio-collared, free-roaming dogs from an Aboriginal community in New South Wales. During 16 behavioral observation periods from November 1994 until May 1995, dogs were observed hunting eastern grey kangaroos (*Macrupus giganteus*), swamp wallabies (*Wallabia bicolor*), and macropods by park staff, the investigator,

and visitors. The researcher notes the role that free-roaming dogs could play in the transfer of disease to other humans and wildlife species.

Miller, Scott G., Richard L. Knight, and Clinton K. Miller.
2001 "Wildlife Responses to Pedestrians and Dogs." *Wildlife Society Bulletin*. 29(1): 124-132.

Studied the response of vesper sparrows, western meadowlarks (grassland birds) and mule deer to dogs on leash, off leash, and humans without dogs. Founds the birds would flush earlier when any of these approached off trail than on trail; and that dogs off leash generally caused less probability of a reaction at a certain distance (authors called this the "area of influence") than dogs on leash or pedestrians alone. Authors attributed this to the fact that dogs resemble coyotes, and coyotes are not typically predators of songbirds likes these, therefore the birds "may not have perceived dogs as an important threat." For mule deer, presence of a dog resulted in a greater area of influence, altert and flush distance, and distance moved than when a pedestrian was alone.

National Park Service
n.d. *Marin City Ridge Boundary Study, Marin Headlands*. Golden Gate NRA

This report focuses on the feasibility of a Marin County request that NPS consider expanding the GGNRA boundary to include properties in southern Marin County. The area in question (three separate properties) is undeveloped open space separating the park from the community of Marin City. This area has recently been the focus of major development proposals that have generated considerable public opposition. The study reviews the affected environment (vegetation, wildlife, cultural resources, geology/soils, socioeconomic factors, and land use). Evaluation indicates that all three parcels would be appropriate additions to the GGNRA and would provide, among other things, a substantial increase in opportunities for non-auto access to the park, protection of park view shed, and protection of Oakwood Valley watershed from urban runoff, disruptive and damaging effects of domestic animals, spread of alien plants, fire and trespass activities. Three fee-related alternatives were also reviewed.

n.d. Documents relating to the GGNRA Citizens' Advisory Commission's Work on a Pet Policy for GGNRA

A variety of documents related to the GGNRA pet policy and its historical development including:

- A 1992 citizens petition protesting imposition of the leash law at Fort Funston and follow-up correspondence from GGNRA,
- Correspondence related to Fort Funston, Crissy Field Site Improvements, dog policies in the Marin Headlands,
- NPS communications with Coalition for San Francisco Neighborhoods, Sir Francis Drake Kennel Club (1977), City/County of San Francisco Animal Control and Welfare Commission (1977), San Francisco Society for the Prevention of Cruelty to Animals, Associated Pet Walkers of Fort Funston, GGNRA Citizens' Advisory Commission (w/meeting minutes from 1979),
- NPS 4/1976 Dog Policy document and press releases,
- NPS document on dog problems in Sutro Park, 1978,
- NPS documents related to public hearings on pet policy

1979 GGNRA Advisory Commission Approved Guidelines for a Pet Policy – San Francisco and Marin County (Muir Beach & South)

The pet policy for GGNRA is outlined including definitions (unmanaged dogs, managed dogs, voice or leash control). Discussion of unmanaged animals (not allowed in GGNRA), licensing requirements, and a listing of regulations, by area, within GGNRA

1980 *GGNRA General Management Plan and Environmental Analysis*
1984a *Final Natural Resources Management Plan and EA for GOGA*
1984b *Natural Resources Management Plan and Program and EA Revisions*
1985 *Natural Resources Management Plan and EA January 1985 Revision*
1991a Draft Natural Resources Section of the Resources Management Plan for GOGA
1991b *Environmental Assessment and FONSI for Habitat Restoration for Mission Blue and San Bruno Elfin Butterflies*

The EA and FONSI address habitat restoration activities and their impacts related to the mission blue and San Bruno elfin butterflies, both listed as Federally endangered species. The primary threats to the butterflies are the intrusion of exotic vegetation species and off-trail and off-road use by visitors which causes further loss of food plants. The selected alternative included the installation of signs/barriers to prevent trampling and off-road vehicle use, exotic plant removal and revegetation. Monitoring the success of revegetation activities will continue for ten years.

1991c *Supplemental EA and FONSI for Marin Trail Use Designation*

This supplement was prepared to add the recommendation of the public and GGNRA Advisory Commission after review of the EA to analyze four alternatives for bicycle use in GGNRA.

1993 *Sutro Historic District Comprehensive Design and Environmental Assessment*; prepared by EDAW, LCA, ERA, DKS Associates, BioSsytems Analysis, Inc., Kennedy/Jenks Consultants and Joe McBride, U.C. Berkeley

This is an EA that examines rehabilitation of the Sutro Bath area. The design is meant to strike a balance between the natural and built environments. Facilities and activity areas would be located primarily at the Cliff House and Merrie Way and a new Visitor Center Complex is envisioned on the slope below the Merrie Way parking lot.

1994 *GGNRA General Management Plan Amendment and EIS, Presidio of San Francisco* (2 volumes)
1996a "Compendium of Designations, Closures, Permit Regulations and Other Restrictions Imposed Under Discretionary Authority by the General Superintendent," GOGA with accompanying memo from Chief Ranger

The Compendium outlines the 1996 revisions to the GGNRA's pet policy. It lists the areas designated as voice control areas where obedient pets may be allowed off leash These areas include Fort Funston/beach, Northern Ocean Beach, Baker Beach, Crissy Field/Beach, West Pacific Avenue, Rodeo Beach, Muir Beach, and Oakwood Valley (maps of each area included). These areas are subject to periodic review and possible modification/termination of dog use to protect park resources/values and/or to promote visitor safety and enjoyment. The memo from the Chief Ranger also mentions Lands End and Sutro Heights, San Mateo County, and Phleger Estates that either prohibit dogs or require leashes.

1996b *Crissy Field Plan EA*, prepared by Jones & Stokes

NEPA compliance document for the restoration of 100-acre Crissy Field site from "broad expanse of deteriorating surfaces and restricted access" including restoration of historic airfield element, and reintroduction of ecological systems, while at the same time maintaining and enhancing Crissy Field as a "people place" with a variety of recreational activities. Evaluates two action alternatives and the No Action alternative.

1996c *EA for Restoration Plan for Lobos Creek, Presidio of SF*, by Hardin Lawson Associates

The original GMP for the Presidio indicated that Lobos Creek should be maximally protected and restored. The proposed action would have involved physical modifications and revegetation to restore Lobos Creek's natural ecosystem and provide for public access and education. However, storms in December 1995 caused a sewer main in the area to collapse and cause considerable damage to areas planned for restoration. The EA does not address the changes that might result from this collapse.

1997 *VERP, A Summary of Visitor Experience and Resource Protection Framework*
1998a *GOGA Administrative Draft Snowy Plover Management Plan, Ocean Beach, SF* (Internal Document only)

The draft plan addresses all activities with the potential to adversely affect snowy plovers on Ocean Beach and prescribes measures to minimize those impacts. The proposed management actions are in addition to those measures already implemented, such as enforcement of existing on leash regulations and changes in operation of heavy equipment. Snowy plovers occur from south of Fulton Street in the north, to Sloat Boulevard in the south. This the primary area of focus of this plan

1998b *Pacifica Boundary Study, GGNRA, San Mateo Co., California.* Pacific West Region of the NPS

This document was prepared pursuant to congressional direction to evaluate 16 tracts in the Pacifica area for addition to GGNRA. The study concludes that all of the tracts except one would meet the established minimum criteria for addition of lands of the National Park system.

1998c *Golden Gate NRA Cultural Resources Section of RMP*
1999 *GOGA Natural Resource Management Plan, Natural Resources Section*
2001a *NPS Management Policies* (CD)
2001b *Presidio of San Francisco Vegetation Management Plan and EA*

This plan and EA is a collaborative planning effort between NPS and the Presidio Trust. It addresses all native and landscaped vegetation. A zoning map was developed as the basis for future action; the zones are native plant communities, historic forest and landscape vegetation.

2001c "Cliff Rescues at Fort Funston for Calendar Year 2000"

Listing of cliff rescues of humans (2) and dogs (15) at Fort Funston for the year 2000. Two rangers were injured during these cliff rescues at Fort Funston. In addition, 1 human and 2 dogs were rescued from other areas or GGNRA (Sutro Baths, ROMA, Baker Beach) for the year 2000. One NPS lifeguard was injured as a result of these rescue operations.

2001d *Director's Order 12: Conservation Planning, Environmental Impact Analysis and Decision-Making*

2002 *Advanced Notice of Proposed Rulemaking for Pet Management in Golden Gate National Recreation Area, Reference Documents*. January 2002

This is the reference document that has 15 sections include the ANPR, the enabling legislation for GGNRA, questions and answers etc. It is posted on the park website.

2002a "Federal Panel Recommendation to the General Superintendent on Proposed Rulemaking for Pet Management at Golden Gate National Recreation Area," Revised November 7, 2002

This summarizes recommendations by a panel of senior federal officials that the park should consider going forward with rulemaking to allow off-leash dog walking where it is appropriate. The report summarizes criteria the panel believes should be used in determining appropriateness.

2003 "GOGA Superintendent's Compendium of Designations, Closures, Permit Requirements and Other Restrictions Imposed Under Discretionary Authority," March 14, 2003.

Superintendent's Compendium, in accordance with the regulations and delegated authority provided in 36 CFR, Chapter 1, Parts 1-7, regulatory provision are established for the proper management protection, government and public use of the portions of the GGNRA, Presidio of San Francisco—Area A, Muir Woods, and Fort Point. In addition, written determinations explaining rationale behind the Superintendent's use of this discretionary authority are also included. The document outlines visiting hours, by area, and area closures (including those related to protection of breeding birds/habitat protection; public safety; pets; fishing; organized sports; picnicking; off-trail areas, etc.). Of note is "Section 2.15 Pets" which lists the structures/areas within GGNRA closed to pets. Pet excrement disposal requirements are addressed. These restrictions are specifically designed to protect irreplaceable natural resources and their habitat, as well as to maintain public safety and avoid user conflicts. Dog walking map (exhibit 11) included. The Compendium also addresses permitting; preservation of natural, cultural and archeological resources; camping/food storage; campfires; etc.

2003a "San Francisco Bay Area Network Phase II Vital Signs Monitoring Plan, Working Draft. San Francisco Bay Area Network of National Park Units."

This document discusses all of the data gathering and monitoring that 8 national park units have been conducting over the last few decades, proposing what and where to add to this database, and discusses the general condition of resources in the region.

2004 "Letter from Superintendent Brian O'Neill to interested and committed citizens"

This letter indicated intent to assess whether Negotiated Rulemaking would be helpful, and that mediators initiating this process may contact them for interviews

2005 "GOGA Reg-Neg/NEPA Concurrent Processes Timeline;" January 16, 2005 draft

Nelson, T. A. and Woolf, A.

1986 Mortality of white-tailed deer fawns in southern Illinois. *Journal of Wildlife Management.* 51(2):326-329.

The researchers investigated the causes, extent, and timing of white-tailed deer (*Odocoileus virginianus*) fawn morality in a national wildlife refuge in southern Illinois. Deer fawns were captured, measured, fitted with a radio transmitter collar, and followed to determine home range size, behavior, and cause of juvenile mortality. Out of 16 cases of natural mortality, coyote and domestic dog predation accounted for 69% of these cases. However, the researchers were unable to differentiate reliably between coyote and dog predation. Instead, the presence of each species at the sites of freshly killed carcasses suggested that each was responsible for some of the predation.

Nichols, R. G. & Whitehead, C. J.

1978 The effects of dog harassment on relocated white-tailed deer. *Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies.* 32:195-210

Nichols and Whitehead (1978) researched the effect of dog harassment on released white-tailed deer (*Odocoileus virginianus*) in eastern Tennessee. Dog harassment resulted in the deaths of five of the eleven deer either by direct contact or indirect means. Three controlled chases involving one dog averaged 2.5 km in 21 minutes. Two chases, involving free-running and "control" dogs, averaged 5.6 km in 42 minutes. One chase by free-running dogs ended when the deer was captured after 1.9 km in 25 minutes. The researchers conclude that restoration of deer herds could be significantly impacted by dog harassment, considering the loss of half of the released deer in the current study.

People Organized for Off-leash Parks (POOP)

"Other Parks & Stuff." Available online at http://www.nashvilledogparks.com/poopparks.htm. Accessed on 1 November, 2004.

This website outlines the benefits of dog parks and off-leash areas to dog owners and the community.

Philip Williams & Associates, Stillwater Sciences, John Northmore Roberts & Associates and the Point Reyes Bird Observatory

2003 *Big Lagoon Wetland and Creek Restoration Project, Muir Beach, Ca. Part I. Site Analysis Report*, PWA Ref. #1664.02. Prepared for the National Park Service

Describes the historical and existing physical, ecological, visitor use and cultural characteristics of the Big Lagoon restoration project site (near Muir Beach). Will be used to help in designing low impact, high restoration alternatives.

Pils, C.M. & Martin, M. A.

1974 Dog attack on a communal fox den in Wisconsin. *Journal of Wildlife Management.* 38(2):259-360.

The researchers witnessed the fatal attack of a female red fox (*Vulpes vulpes*) by three dogs, during the pupping season. One fox pup survived for at least 67 days after the attack, most likely due to the polygamous, communal denning arrangement which provided consequent care for the young.

Progulske, D. R. & Baskett, T. S.

1958 Mobility of Missouri deer and their harassment by dogs. *Journal of Wildlife Management.* 22(2):184-192

Progulske and Baskett (1958) researched the effects of dog harassment on deer movements. One hundred ninety-four records of movements were obtained for 31 individuals. Hunting dogs or 'hounds' accounted for the majority of dog chases with only two instances of non-hound chases. 310 chases were recorded within a 19-month period, with the greatest number of chases occurring in November, December, and May, coinciding with raccoon and fox hunting season. Dogs caused deer to leave their home ranges, with the longest chase extending at least 3.25 miles for one-half hour. Dogs were the direct cause of death in three cases over a six-year period. Ultimate effects of the steady harassment of deer were not evaluated in the context of this study.

Roberts, G.

1997 How many birds does it take to put a flock to flight? *Animal Behavior.* 54:1517-1522.

The researcher investigated how an individual bird's decision to fly affected group decision-making in foraging of sanderlings (*Calidris alba*). Roberts found that when flocks were disturbed by people or dogs, the foraging birds tended to act as a cohesive unit, with more departures being of whole flocks. In contrast, undisturbed birds required additional individual departures before the whole flock took flight. The differential effects of dog disturbance versus human disturbance were not measured in the current study.

Roberts, G. & Evans, P. R.

1993 Responses of foraging sanderlings to human approaches. *Behaviour.* 126(1-2):29-43.

Roberts and Evans (1993) experimentally tested the flight responses of sanderlings (*Calidris alba*) to human disturbances. Dog impacts, in particular, were not quantified, but the authors noted a differential response to terrestrial versus aerial predator threats. When sanderlings were threatened by natural avian predators, they flew in a flock, gaining height rapidly. When sanderlings were disturbed by people or dogs, they flew and landed further along the shoreline. The authors suggested that dogs were, indeed, a real threat as they were observed to chase sanderlings repeatedly.

Roelke-Parker, M. E., Munson, L., Packer, C., Kock, R., Cleaveland, S., Carpenter, M., O'Brien, S. J., Pospischil, A., Hofmann-Lehmann, R., Lutz, H., Mwamengele, G. L. M., Mgasa, M. N., Machange, G. A., Summers, B. A. & Appel, M. J. G.

1996 Canine distemper virus epidemic in Serengeti lions (*Panthera leo*). *Nature* 379:441-445.

The authors report on an epidemic affecting the Serengeti lion population in Serengeti National Park, Tanzania in 1994. This morbillivirus, which is closely related to the canine distemper virus (CDV), resulted in a fatal neurologic disease that was characterized by seizures, cases of pneumonia and encephalitis. Eventually, 85% of the lion population had anti-CDV antibodies, 30% of the lions were killed, and the disease spread north to infect hyenas, bat-eared foxes, and leopards. The source of CDV in the epidemic was determined to result from the high density of unvaccinated domestic dogs in the local villages adjacent to the national park. CDV seroprevalence increased in these dogs in the years preceding the epidemic. The most probable route of transmission was the spotted hyena, which ranges among human settlements and the park.

The authors emphasize the need for disease surveillance in wildlife and vaccination programs for domestic animals in contact with wildlife.

Rothman, Hal K.

2002 *The Park That Makes Its Own Weather; An Administrative History of Golden Gate National Recreation Area.*

Describes the evolution of the park through three phases and into its current phase as the "archetype of national park areas in the twenty-first century." The author refers to it this way because of its ability to to involve the public and at the same time adhere to agency and other federal standards, and its joint management of the Presidio, where issues are different from those of traditional national parks.

San Diego Union-Tribune

1997 "Keep the Coast Clean; County has a storm drain runoff problem." July 9, 1997.

Article related to storm drain runoff and its impact to coastal waters. Assemblyman Howard Wayne has proposed legislation that would set standards for bacteria levels, establish uniform protocols for monitoring coastal waters, and mandate regular testing of beaches. Information includes what citizens can do to keep beaches/coastal areas clean (cease illegally discharging pollutants into storm drains, car washing, not cleaning up after pets). Experts agree that dog droppings may be a big problem, particularly when dog owners throw the droppings down the storm sewer.

San Francisco Bay Conservation and Development Commission

2000 "Public Access and Wildlife Compatibility"

The document results in a set of conclusions approved by the Policy Advisory Committee and used as a basis for proposed revisions to the Bay Plan Public Access Policy. Included are discussions of issues related to habitat diversity, the value of public access, the need for additional scientific studies, direct/indirect wildlife impacts, wildlife's adaptation to human disturbance, habitat fragmentation caused by social trails, etc. These conclusions were used to revise the existing San Francisco Bay Plan Public Access Policies, all of which are outlined in the document. In particular, Chapter 2, Biological Effects of Public Access on Wildlife", includes an annotated bibliography or studies related to human disturbance and effects to wildlife. Chapter 3, "Design and Management Strategies to Avoid or Reduce Adverse Effects of Public Access on Wildlife", reports on the Public Access and Wildlife Compatibility Survey conducted, resulting in the following summary statement: 1) the most commonly reported immediate effect on wildlife was from unleashed dogs, followed by walking/jogging, 2) the most commonly reported observed or documented long-term effect on wildlife was from humans feeding wildlife, followed by fishing, and 3) the activity types most commonly reported as having no observed or documented effects on wildlife were photography, followed by bird watching. Design/management mitigation strategies are also discussed.

2001a "Assessment Summary"

This document reviews the San Francisco Bay Conservation and Development Commission's (BCDC) implementation of the federal Coastal Zone Management Act for San Francisco Bay. Areas of high priority are summarized. 1) Public access to coastal areas while protecting wildlife, particularly endangered species, 2) Wetlands protection and restoration, 3) Cumulative and secondary impacts of development by developing and adopting procedures to assess, consider and

control cumulative and secondary impacts of coastal growth/development, 4) Special area management planning to eliminate inconsistencies between plans of different agencies with regulatory jurisdiction over the same areas/issues, 5) Energy and government facility siting, 6) Coastal hazards, and 7) Ocean resources, marine debris and aquaculture.

2001b "Public comments on proposed Bay Plan Amendment No. 5-00, public access and wildlife compatibility"

Compilation of written public comments concerning proposed Bay Plan Amendment No. 5-00 (Public Access and Wildlife Compatibility). Letters of comment addressed substantial detrimental effects of humans on sensitive resources (wildlife), including endangered species; the need for proper siting of development; issues related to multiple missions of agencies (public access and provision of services); increasing need for recreation and public access; the lack of data to support the assumption of detrimental effects to wildlife resulting from public access; the need for cooperative planning; loss of habitat/feeding time related to disturbance by humans and pets, off-leash dogs; support for future research, etc. The 3/20/01 letter from the USFWS indicates that non-compliance with existing regulations creates additional threats to wildlife (i.e., pedestrians entering restricted areas, non-compliance with pet and leash laws). Impacts of off-leash dogs are also discussed in detail in this letter.

San Francisco Chronicle

2001 "A Growing Pet Peeve" by Michael McCabe, January 20, 2001.

General information about Bay Area restricting dogs off leash in some areas (Stanford U. area around the "dish," and about federal acquisition of Bair Island, which FWS plans to restore to wetland to support clapper rail and salt marsh harvest mouse. Area has been used by off leash dog walkers for many years until recently decided to restore to wetlands. Right now rules are posted that dogs must be kept under voice or other control and on trails, and owners must pick up poop. Dog walkers are disobeying despite education and now ticketing. Next steps are to order dogs on leash and then ban them from the site. Perception by park and refuge managers is that "a very small number of dog owners are ruining it for others."

San Francisco Dog Owners Group

n.d. "Pet Policy." Available online at http://www.sfdog.org/dogpolicyfinaldoc%20(Word6).pdf. Accessed on 15 December, 2004.

This document sets out ways in which families with and without pets may share the parks. It recognizes the variety of activities under the term "off-leash recreation," and also recognizes that not all these areas are appropriate for dogs and their guardians at all times. However, it takes the stance that, wherever and whenever possible, parkland should be shared.

"Run Free." Available online at http://www.sfdog.org/features/wild.htm. Accessed on 15 December, 2004.

This document lists "dog-friendly places" where dog-owners can take their pet in San Francisco. Different colored paw prints next to each listing indicate whether it is on-leash, off-leash, or threatened/pending.

San Francisco Recreation & Park Department

2002 "Final Dog Policy." Available online at http://sfgov.org/site/recpark_index.asp?id=2180. Accessed on 16 December, 2004.

The final dog policy for the San Francisco Recreation and Park Department, revised from a draft first released in June, 2001. The purpose of the policy is to provide guidelines and rules so that civilized compromises can be reached in each community for balancing many conflicting land uses. A set of site criteria is included to aid in determination if an area is appropriate for dog use. These criteria include size and location of parcel, boundaries/barriers, surfacing, amenities, etc. Prior to the plan 19 designated areas allowed off-leash dogs. The plan calls for the evaluation of existing and proposed sites in the context of this policy. Dogs are not allowed in some areas, including sensitive habitat areas.

2004a Dog Advisory Committee Meeting, meeting minutes, September 9, 2003.

Among other things, this document proposes a policy related to the regulation of professional dog walkers. It is not apparent that this proposal passed. Further discussion on fees for professional dog walkers is included and staff plans to develop a fee proposal.

2004b Dog Advisory Committee Meeting, meeting minutes, September 14, 2004, Available online at http://www.parks.sfgov.org/site/recpark_page.asp?id=28237. Accessed on December 16, 2004.

This document contains meeting notes from a San Francisco Dog Advisory Meeting. These notes detail some of the concerns the committee must handle related to dog management within the city.

San Francisco Department of Animal Care and Control

n.d. "Animal Care& Control: License Fees." Available online at http://sfgov.org/site/acc_index.asp?id=6619. Accessed on 16 December, 2004.

This document explains why it is important for dog-owners to license their dogs, how they can buy licenses, and how to obtain those licenses online. Attached is a dog license application.

Schaefer, Joe.

2003 "Impacts of Free-ranging Pets on Wildlife." University of Florida, IFAS Extension. Available online at http://edis.ifas.ufl.edu/BODY_UW090. Accessed on 1 November, 2004.

This document is WEC-136, one of a series of the Department of Wildlife Ecology and Conservation, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida (originally published in December 1991). Dogs and cats (free ranging pets) are domesticated predators and have the potential to severely impact local wildlife populations. In addition they carry human and wildlife diseases (ringworm, distemper, rabies) and can be an important factor in introducing these diseases into susceptible wildlife populations. Animals that feed/nest close to the ground are the most susceptible.

Shawano County.

2004 "Dog Regulation Guideline Manual." Available online at http://www.co.shawano.wi.us/departments/county_clerk.aspx. Accessed on 16 December, 2004.

This document is a reference guide for issuing dog licenses and processing dog claims in Shawano County, Wisconsin.

Shine, Gregory Paynter

2002 "The Hair of the Dog that Bit You: Using special events to help understand and manage their impacts—A case study of Crissy Field, GGNRA." *The George Wright Forum* 19: (1): 92-103

GGNRA had a recent opportunity to reevaluate the size, duration and frequency of recreational activities allowed at Crissy Field. One of the biggest concerns related to resource impacts were the large special events that occurred historically along the Golden Gate Promenade, the thoroughfare along the Crissy Field waterfront. When a 23-ac. saltwater marsh was reintroduced in a formerly paved area and a wildlife protection zone along the dunes and beach to its north were established, the scope of special events and their impacts needed to be reevaluated. Staff gathered essential baseline vegetation data for Crissy Field prior to the annual Bridge to Bridge Run. Monitoring positions where established to record the effects of the event on vegetation. The most notable impacts were two separate incidents when people entered restricted areas during the race event but staff believed this resulted in only minor impacts to vegetation. Assessing impacts to wildlife (primarily birds at Crissy Field) during similar large-scale events is more difficult. GGNRA developed the "Avian Monitoring Objectives for Crissy Field" which uses three measures of use: abundance, richness, and diversity. Studies to document avian use of the area occurred before, during and after the event with emphasis on the tidal wetland area immediately adjacent to the promenade. Findings indicate that, despite intense human use in the area, avian use of the site was not limited by it. These low-cost studies resulted in valuable insight to the effects of recreational activities on park resources and will aid in future management decisions.

Sillero-Zubiri, C., King, A. A. & Macdonald, D. W. 1996. Rabies and mortality in Ethiopian wolves (*Canis simensis*). *Journal of Wildlife Diseases*. 32(1):80-86.

The researchers investigated the deaths of 41 Ethiopian wolves from a group of 52 radio-collared adults and subadults between October 1991 and February 1992. Brain smears from two carcasses were positive for rabies, and the virus was identified as deriving from serotype rabies 1 virus found in domestic dogs and wild canids from Africa. Additional anecdotal observations such as wolf limb incoordination and whole body convulsions suggest that additional wolves may have also been infected with the virus. Dog-wolf hybrids were seemingly more resistant to the epidemic, compared to phenotypically normal wolves. These results support the view that domestic dogs are the most likely source of infection for Ethiopian wolves.

Sime, Carolyn A.

n.d. "Domestic Dogs in Wildlife Habitats: Effects of Recreation on Rocky Mountain Wildlife." *A Review for Montana*. Available online at http://www.montanatws.org/PDF%20Files/8dogs.pdf. Accessed on 12 November, 2004.

This report reviews information about the effects of recreation on wildlife habitat, focusing on dogs specifically (From May & Assoc. review). The primary objective of the article is to increase the awareness among natural resource professionals and the public about the potential implications of uncontrolled domestic dogs in wildlife habitats and to summarize information, where available, about documented impacts. Uncontrolled domestic dogs still maintain instincts to hunt and/or chase and often disturb, harass, displace or directly cause death to wildlife.

Domestic dogs may introduce or transport diseases and parasites into wildlife habitats. Dogs can flush incubating birds from their nests and disrupt breeding displays, shorebird foraging, and duck roosting. People with dogs often provoked the largest response. Even if dogs do not chase, their presence has been shown to disrupt wildlife species. Secondarily, the objective of the article is to encourage resource managers to proactively consider the issue, despite the inadequacies of current information. Managers may consider the following when evaluating recreational impacts of dogs in wildlife habitats: species biology, reproductive potential, abundance, density, distribution, degree of habitat specificity or reliance on certain habitat components, and predisposition and sensitivity to disturbance by other agents. This information is intended to increase awareness among natural resource professionals and the public about the potential implications of uncontrolled domestic dogs in wildlife habitats and to encourage responsible outdoor recreation ethics.

Social Research Laboratory, Northern Arizona University

2002 *Public Opinion Research Telephone Survey Regarding GGNRA Pet Management Issues*, Technical Report.

This document analyzes the results of 1,600 telephone surveys conducted in the 4-county Bay Area during the same period as the ANPR was being reviewed. The data from these surveys was broken down by income bracket, dog ownership, park usage and race. Participants were asked 20 questions. The above data are available for each question.

2002a *Golden Gate National Research Area Announced Notice of Proposed Rulemaking, Public Comment Analysis*

This document summarizes the nearly 8,600 comments received on the ANPR, including the percentage of those favoring one option or another, and a summary of commonly heard responses to the questions asked in the ANPR.

Soluri, P. M.

1994 Bird flushing at Hoffman Marsh. In:Contemporary Topics in Environmental Sciences. Sloan D., Edlunds, E., Christensen, M., & Taylor, K. (eds). University of California, Berkeley.

Soluri (1994) researched the effects of dog disturbance on birds in marsh and trail areas at Point Isabel Regional Shoreline in the San Francisco Bay. A disturbance was defined as any dog activity in the marsh, whereas a flush was defined as a disturbance that caused a bird to expend energy. A total of twenty disturbances were observed over 30 hours of observation, resulting in an average of 1.7 disturbances per hour. Disturbance rates ranged from two disturbances in two minutes to zero disturbances in three hours. Out of the twenty observed disturbances, five resulted in flushing birds. The investigator noted that although a disturbance did not always result in flushing birds from the marsh, birds might have become sensitized to the area where disturbances occur and avoid this region, resulting in a reduction of resources. The researcher also found that the tide level influenced a bird's reaction to disturbance. The average tide level during a flush was higher than during a disturbance. The researcher suggests that higher densities of birds are forced to feed at the marsh during high tides when mudflats are covered.

SPCA of Monterey County newsletter

n.d. "The SPCA Wildlife Center helps heal—through rescue and education—the damage humans cause to wildlife"

Short discussion of how humans can unwittingly endanger wildlife. The majority of animals brought in to the SPCA Wildlife Center are injured or orphaned as a direct result of actions by humans (being hit by cars, tangled in fishing lines, falling out of nests when trees are cut down, injured by domestic dogs/cats.)

Striplen, Chuck, R. Grossinger, J. Collins

2004 "Wetland Habitat Changes in the Rodeo Lagoon Watershed, Marin County, Ca." A Technical Report of the Historical Ecology and Wetlands Programs, SFEI Contribution 116, San Francisco Estuary Institute, Oakland, CA

This report was prepared in the context of transportation planning and improved public access to the GGNRA, specifically the Rodeo Lagoon watershed. The Rodeo Lagoon watershed is located at the very southern end of Marin County, within GGNRA jurisdiction. The GGNRA is attempting to identify areas suitable for restoration/ habitat improvement. To aid in the process, the authors undertook several tasks including: 1) identification of areas of land use "improvement", 2) estimating changes in distribution/abundance of basic wetland types within the time period of European contact to the present, as well as identifying causes of the changes, and 3) identification and prioritization of potential ecological restoration sites. The report summarizes the major land uses affecting wetland habitats over the past two centuries (e.g., drainage/sewage structures, transportation routes, military facility construction/expansion, ranching/farming operations). Management implications and restoration opportunities are identified.

Sweeney, J.R., Marchinton, L. and Sweeney, J.M.

1971 "Responses of radio-monitored white-tailed deer chased by hunting dogs," *J. of Wildlife Management* 35(4):707-716

Sweeney et al. studied normal movement patterns of radio-monitored white-tailed deer to determine the impacts of hunting dogs on deer movements. Deer were radio-located every two hours for one to two months to determine their typical movement patterns and home range size. In the following three-year period, 65 experimental chases involving six deer were recorded, lasting an average of 10 to 85 minutes. Deer left their home ranges in 78% of the chases, but returned within one day. In one case, a deer abandoned its home range for a new range with a center 3 miles from the original center of activity. During this study, no deer were captured or killed by hunting dogs, and the authors state that all deer remained in good physical condition. The researchers warn that caution should be used when applying these results to feral or free-ranging dogs that tend to differ in their hunting behaviors.

Taborsky, M.

1988 "Kiwis and dog predation: observations in Waitangi state forest." *Notornis* 35:197-202

During a study to determine population dynamics of the North Island brown kiwi (*Apteryx australis mantelli)* Taborsky found that 56% of his radio-tagged birds had been predated by a single dog within a month's period. The author calculated that it would take 8 to 20 years for the number of birds on the island to recover, as the dog had killed more than half the island population before it was caught and removed.

U.S. Fish and Wildlife Service

1983 Nonconsumptive Outdoor Recreation: An Annotated Bibliography of Human-Wildlife Interactions. Special Scientific Report—Wildlife No. 252, 87 pps

2001a *Draft Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula.* US FWS, Portland, Ore., xv+253 pps.

The plan features two federally endangered plant species endemic to the northern San Francisco peninsula, San Francisco lessingia (*Lessingia germanorum*) and Raven's manzanita (*Arctostaphylos hookeri* ssp. *Ravenii*). Both are known to exist in the Presidio, including the only known genetic individual or the manzanita (clones have been transplanted)

2001b Correspondence regarding Public Access and Wildlife Compatibility report and proposed revisions to Bay Plan public access policies in SF

This letter of comment proposes revisions to the Public Access and Wildlife Compatibility staff report with emphasis on wildlife, project siting and design, consistency of projects with physical environment, and continued research efforts of effects of public access on wildlife. Extensive discussion of disturbance impacts with specific examples related to the western snowy plover, the piping plover, the California least tern, and the California clapper rail, all of which are either federally threatened or endangered. The letter also indicates that non-compliance with existing regulations creates additional threats to wildlife (i.e., pedestrians entering restricted areas, non-compliance with pet and leash laws). Impacts of off-leash dogs are also discussed in detail in the letter.

2001c *Draft Recovery Plan, Western Snowy Plover* (*Charadrius alexandrinus nivosus*), Pacific Coast Population. California/Nevada Operations Office, Region 1, May 2001. (We do not have this; used the May & Assoc. document)

Feral dogs are suspected to have disturbed snowy plover nests and chicks on SF salt ponds in 1998; plovers flushed more frequently and remained off their nests longer when a person was with a dog; joggers or walkers with off-leash dogs caused a significantly greater number of avoidance responses from snowy plovers than other types of disturbances.

2002 *Recovery Plan for the California Red-legged Frog* (*Rana aurora draytonii*), Region 1, USFWS, Portland, Oregon. viii+ 173 pps.

This sub-species is listed as threatened. It lives in riparian and upland areas in coastal drainages of central California south to Baja. It requires aquatic habitats for breeding. The California red-legged frog has been extirpated for 70% of its former range. Actions needed include the protection of known populations and suitable habitat.

2004a. *Draft Recovery Plan for the Tidewater Goby* (*Eucyclogobius newberryi*). U.S. Fish and Wildlife Service, Portland, Oregon. vi + 163 pp.

Summarizes status, habitat requirements, recovery objectives, recovery criteria, actions needed and estimated cost of recovery over the next 10 years ($1.5 million). The goby is a small fish that inhabits coastal brackish water habitats entirely within California from the northern to southern borders of the state. Actions needed include monitoring, protecting and enhancing currently occupied tidewater gob habitat and evaluating and implementing translocation where appropriate.

2004b. "90-day finding on a petition to delist the Pacific Coast population of the Western snowy plover and initiation of a 5-year review." *Federal Register* Notice February 20, 2004.

Ninety-day finding on the petition to remove the Pacific Coast population of the western snowy plover from the federal list of threatened and endangered list based on the presentation of substantial information indicating this move may be warranted. New information on the population is being requested after which a status review will result in a 12-month finding on the petition to delist. The Pacific Coast snowy plover population was listed on 3/5/93 and critical habitat was designated on 12/7/99. In 2003, the US District Court for the District of Oregon found that the critical habitat designation was not consistent with the requirements of section 4(b)(2) of the Act, remanded the designation to the USFWS, and vacated the 1999 critical habitat designation. A biology and distribution discussion is also included, as well as information on the discreetness and significance of the western snowy plover in relation to the remainder of the species.

2004c. "Proposed designation of critical habitat for the Pacific Coast population of the Western snowy plover, 50 CFR Part 17." *Federal Register* notice v. 69, # 242, December 17, 2004.

This document was prepared in response to the 2003 US District Court decision that partially vacated the 1999 critical habitat designation for western snowy plover and remanded the previous designation of critical habitat for preparation of a new analysis of economic impacts. In this new evaluation, lands containing habitat features essential to the conservation of the western snowy plover were identified. The Service proposes the designation of approximately 17,299 acres within 35 units along the coasts of California, Oregon, and Washington. Public comments are requested by 2/15/05. Discussion of how critical habitat is designated is included (methods, criteria, procedural difficulties, etc.). Critical habitat units, by state, are listed and discussed.

USGS

2001 Effects of the Domestic Dog on Natural Resources: An Annotated Bibliography; prepared by Jennifer Shulzitski and Catherine Sweeney. Articles also included.

US Institute for Environmental Conflict Resolution

2004 *Situation Assessment Report: Proposed Negotiated Rulemaking on Dog Management in the Golden Gate National Recreation Area*, September 14, 2004. Prepared by the Center for Collaborative Policy and CDR Associates.

Summarizes the results of interviews with 45 people on all sides of the dog management issue at GOGA to determine whether negotiated rulemaking is feasible and likely to be successful. Concludes the potential for success is present.

Van't Woudt, Bessel D.

1990 "Roaming, stray and feral domestic cats and dogs as wildlife problems." Proceedings 14th Vertebrate Pest Conference, pps 291-295. L.R. David and R.E. Marsh, eds.

This article summarizes the history of the domestication of cats and dogs by humans and their resulting dependency on humans for survival. As predators of wildlife and livestock, cats and dogs fall into three categories: 1) roaming but focused on home/owner, 2) stray, no home/owner but depends on human environment for food/shelter, and 3) feral, surviving in the wild. Damage

to wildlife and livestock by cats and dogs is discussed. There is a good case for leash laws and keeping dogs fenced in rural areas. In New Zealand, a roaming German shepherd in a prime habitat close to human settlement killed some 500 kiwis out of a total population of some 900 birds, one after the other, without any being eaten. For successful hunting, it is advantageous for a domestic dog to be a pack member. The author concludes that dogs can be potentially destructive animals and demand strict control.

Watson, Adam.
1979 "Bird and Mammal Numbers in Relation to Human Impact at Ski Lifts on Scottish Hills." *Journal of Applied Ecology.* 16; 753-764.

This study looks at the effects of human presence on wild populations of various species found in the Scottish highlands. It provides anecdotal observations of the effects of unleashed dogs on ptarmigan and grouse.

Wedin, D.A. and D. Tilman
1996 "Influence of nitrogen loading and species composition on the carbon balance of grasslands." *Science* 274.

We do not have this article. From May & Assoc.: Nitrogen deposition on Minnesota grasslands shifting dominance from native warm-season grasses to low-diversity mixtures dominated by cool-season grasses. Dramatically changed species composition, decreased species diversity and increased aboveground productivity. After 12 years of nitrogen addition, species richness declined by more than 50% across the nitrogen gradient.

"Western Snowy Plover Wintering Population Ocean Beach; Annual Summary Data 1994-95 Season through 2000-2001 Season"

This is a one page summary of 5 charts that I don't have.

Wisch, Rebecca F.
2003 "State and Municipal Regulation of dogs." Michigan State University – Detroit College of Law. Available online at http://www.animallaw.info/articles/art_details/print.htm. Accessed on 16 December, 2004.

This paper analyzes the police power authority vested in local governing units, specifically those statutes that enable municipalities to enact ordinances affecting dogs. It further explores the constitutional challenges to these ordinances, noting that nearly all such challenges have been held as valid exercises of police power. Within these challenges often emerges the issue of preemption, where state or even federal law usurps a municipal ordinance. Finally, the paper summarizes the relevant statutes for each state that specifically grant local municipalities to regulate some aspect of dogs.

Yalden, P.E. and D.W. Yalden
1990 "Recreational Disturbance of breeding golden plovers *Pluvalis apricarius.*" *Biological Conservation* 51: 243-262

During incubation, golden plovers flushed more readily and flushed at greater distances in response to the presence of dogs that people on the moor. Three golden plover deaths were concluded to be due to dogs.